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Original Research Article

A cross-sectional study on depression among people living with HIV attending anti-retroviral therapy center in Jaya Arogya Group of Hospital, Gwalior, Madhya Pradesh

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ABSTRACT

Background: India is committed to 'ending the AIDS' epidemic as a public health threat by 2030 in line with sustainable development goals (SDG). This ambitious target cannot be achieved without meeting the needs of people living with and affected by HIV and the determinants of health and vulnerability, being addressed. PLHIV often experience depression. Mental health concerns with depression, represent a major challenge for individuals managing HIV. Understanding the psychological landscape of those receiving specialized care is essential for improving overall health outcomes and survival rates.
Methods: A hospital-based cross-sectional design conducted over a twelve-month period. The study focused on 380 HIV-positive participants within the 25 to 35 years of age. Assessments were performed using a structured questionnaire and the Hamilton depression rating scale to measure the presence and intensity of symptoms. Data were analyzed using SPSS v27, with $p<0.05$ considered significant.
Results: The study found that 26.3% of the participants suffered from depression. Statistical analysis highlighted several factors associated with higher rates of mental distress. Individuals who were separated from their partners, those living alone without family support, and those identifying as transgender showed significantly higher levels of depression.
Conclusions: Depression status was found to be statistically significantly associated with gender, marital status and type of family. The lack of family support drastically increased depression risk, individuals whose last counselling session was more than three months ago experienced significantly higher depression compared to those counselled recently.

Keywords: AIDS, Anti-retroviral therapy, Depression, Hamilton depression scale, MSM, PLHIV

INTRODUCTION

On June 5, 1981, the US Centers for Disease Control and Prevention (CDC) first described a cluster of unusual infections among men who have sex with men (MSM) in New York and California, which led to the recognition of a new disease entity termed acquired immunodeficiency syndrome (AIDS).[1]

The affected individuals were diagnosed with rare opportunistic infections such as Pneumocystis (carinii) jirovecii pneumonia and Kaposi's sarcoma, a malignancy of the skin that generally occurs only in individuals with a weakened immune system.[2] The causative agent responsible for AIDS was identified two years later, and in 1986, the International Committee on Taxonomy of Viruses officially designated it as the human immunodeficiency virus (HIV).

HIV transmission occurs primarily through sexual contact (both heterosexual and homosexual), transfusion of infected blood, sharing of contaminated needles or

syringes, and vertical transmission from an infected mother to her child. The infection initially remained concentrated within certain key populations or high-risk groups, including sex workers, MSM, transgender individuals, and injecting drug users (IDUs).

As of 2012, the estimated HIV prevalence among adults in the general population was 0.27%, corresponding to approximately 20.89 lakh people living with HIV/AIDS (PLHA).[3,4] Among these, children below 15 years of age accounted for nearly 7% (1.45 lakh) of cases. The country also reported about 1.16 lakh new HIV infections among adults and 14,500 among children in 2011.

Furthermore, the presence of opportunistic infections, and adverse effects of antiretroviral therapy may resemble depressive symptoms such as fatigue, poor concentration, somatic complaints, reduced appetite, and weight loss.[5] Conversely, various psychiatric disorders, including depression, may increase vulnerability to HIV acquisition by influencing high-risk behaviors.[6,7]

Evidence from international studies, especially from developed nations, indicates that the prevalence of depression among people living with HIV/AIDS (PLHAs) is significantly higher than that observed in HIV-negative individuals.[8,9] In contrast, limited information is available regarding mental health problems and related needs of PLHAs in developing countries like India, which are heavily burdened by the HIV epidemic.[10,11] Young adults living with HIV often face stigma that adversely affects mental health, treatment adherence, and quality of life. Understanding the prevalence and determinants of depression and stigma is essential for designing targeted psychosocial interventions and strengthening comprehensive HIV care services.

METHODS

Place of study

The study was conducted at the antiretroviral therapy (ART) centre of the Jaya Arogya Group of Hospitals in Gwalior, Madhya Pradesh.

Period of study

The present study was carried from 1st May 2024 to 30th April 2025.

Sample size determination

The sample size was estimated by document analysis, titled: a cross-sectional study on stigma and discrimination confronted by HIV positive patients in the economic capital of India. Using the formula:

$$n = \frac{Z^2_{(\alpha/2)} P(100 - P)}{d^2}$$

and assuming a 5% level of significance and 5 % absolute error and p value of 43.45, the minimum sample size was 378, rounding in total of 380 subjects.

Objective

The objective was to estimate the prevalence of the depression and assess the socio- demographic, and behavioral factors that contribute to mental health challenges among patients at anti-retroviral therapy facility in Gwalior.

Inclusion criteria

All registered participants who are HIV positive and in between 25 to 35 years of age irrespective of gender attending ART Centre, JAH, GRMC, Gwalior. All HIV positive patients registered at ART Centre, JAH, Gwalior to give consent for his/her participation to study.

Exclusion criteria

Participants below 25 years of age and above 35 years of age. Severely ill patients. Patients diagnosed with AIDS. Participants not willing to participate in the study.

Ethical consideration

The study received ethical clearance from the Institutional Ethical Committee, Approval no.- 1449/IEC-GRMC/2024; Dated: 01/05/2024 of Gajra Raja Medical College, Gwalior (MP).

Study procedure

A total of 380 participants were interviewed by a pre-designed, pre structured, pre-validated questionnaire. Informed consent has been taken from each participant in their local language and the confidentiality would be maintained. The study tools are Berger stigma scale and Hamilton depression scale.

The scoring of the Hamilton depression rating scale (HAM-D) involves adding up the scores for each item to get a total score, which is then interpreted to determine the severity of depression. A typical interpretation is 0-7 for no depression, 8-16 for mild depression, 17-23 for moderate depression, and 24 or higher for severe depression.

Statistical analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 27.0. Variables were represented as frequency and percentage and analyzed using the Chi-square test. A p value <0.05 was considered statistically significant.

RESULTS

A total of 380 participants were included in the study. The study population was predominantly male (74.7%), with females constituting about one-fourth (24.5%). Slightly more than half of the participants were aged 31 years or above (53.9%).

With respect to educational status, the majority had attained at least middle school education, and one-fifth of the participants were graduates or post-graduates (20.3%). Illiteracy was observed in a relatively small proportion (7.6%). Occupationally, unskilled workers formed the largest group (31.0%), followed by semi-skilled (23.7%) and skilled workers (10.3%), reflecting a predominantly lower to middle occupational profile.

Table 1: Distribution of study participants according to their socio-demographic profile (n=380).

Variables		Frequency	Percentage
Gender	Male	284	74.7
	Female	93	24.5
	Transgender	03	0.8
Age groups (in years)	≤30	175	46.1
	≥31	205	53.9
Education	Illiterate	29	7.6
	Primary school	73	19.2
	Middle school	76	20.2
	High school	61	16.1
	Intermediate	64	16.8
	Graduate/post graduate	77	20.3
Occupation	Student	20	5.3
	Professional	34	8.9
	Semi Professional	08	2.1
	Clerical	11	2.9
	Unskilled	118	31.0
	Shop owner	22	5.8
	Farmer	38	10.0
	Skilled	39	10.3
	Semi-skilled	90	23.7
Socio-economic status (Revised BG Prasad Classification Jan 2025)	I Upper Class	65	17.1
	II upper middle class	125	32.9
	III middle class	113	29.7
	IV lower middle class	63	16.6
	V lower class	14	3.7
Caste	General	198	52.0
	OBC	118	31.1
	scheduled caste	58	15.3
	scheduled tribe	6	1.6
Religion	Hindu	347	91.3
	Muslim	22	5.8
	Sikh	8	2.1
	Christian	3	0.8
Residence	Urban	232	61.0
	Urban slum	28	7.4
	Rural	120	31.6
Marital status	Married	195	51.2
	Unmarried	153	40.3
	Divorced	6	1.6
	Widow	17	4.5
	Separated	9	2.4
Family type	Single	30	7.9
	Nuclear family	210	55.3
	Joint family	140	36.8

Table 2: High risk sexual behaviour of study participants.

Variables		Frequency	Percentage
Adherence to ART	Non adherent	84	22.1
	Adherent	296	77.9
Time elapsed since last counselling in months	<1	82	21.6
	>3	114	30.0
	1-3	184	48.4
Duration of treatment in years	<1	76	20.0
	1-4	158	41.6
	>4	146	38.4
Alcohol intake before sexual intercourse	Yes	53	13.9
	No	327	86.1
Smoking status before sexual intercourse	Yes	93	24.5
	No	287	75.5
Use of condom	Yes	258	67.9
	No	122	32.1
Sexual Partners	Single sexual partner	222	58.4
	Multiple sexual partner	49	12.9
	Presently without partner	109	28.7

According to the Revised BG Prasad socio-economic classification (January 2025), most participants belonged to the upper-middle (32.9%) and middle (29.7%) classes, while a smaller proportion belonged to the lower-middle (16.6%) and lower (3.7%) classes. More than half of the participants were from the general caste category (52.0%), followed by other backward classes (31.1%) and scheduled castes (15.3%).

The majority of participants were Hindu (91.3%). Most participants resided in urban areas (61.0%), followed by rural areas (31.6%), indicating a predominantly urban study population. In terms of marital status, about half of the participants were married (51.2%), while a substantial proportion were unmarried (40.3%). With regard to family structure, more than half of the participants belonged to nuclear families (55.3%), followed by joint families (36.8%).

Table 3: Prevalence of depression in the study population (n=380).

Depression status	Frequency	Percentage
Present	100	26.3
Absent	280	73.7
Total	380	100.0

Most participants were adherent to ART (77.9%). Nearly half had received counselling within the past 1-3 months (48.4%), while 30.0% reported a gap of more than three months. About two-fifths had been on treatment for 1-4 years (41.6%). Alcohol and smoking before sexual intercourse were reported by 13.9% and 24.5% participants, respectively. Condom use was reported by 67.9%, while 32.1% did not use condoms. Most participants had a single sexual partner (58.4%), whereas 12.9% reported multiple partners.

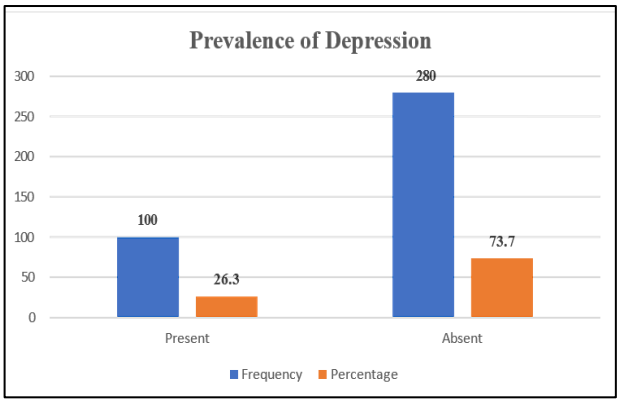

Figure 1: Prevalence of depression in the study population (n=380).

Depression was found to be present in 100 individuals, giving an overall prevalence of 26.3%. The remaining 280 participants (73.7%) did not have depression. Thus, approximately one in four participants in the study population was affected by depression, indicating a substantial burden of depressive morbidity among people living with HIV attending the ART center.

Depression was present in 26.3% of the study participants. On bivariate analysis, depression showed a significant association with gender (χ^2=9.687, p=0.008), with higher prevalence among females and transgender participants. Occupation was also significantly associated with depression (χ^2=21.663, p=0.006), with higher proportions among unskilled workers and shop owners. In contrast, age group, education, socio-economic status, caste, religion and place of residence were not significantly associated with depression. Regarding high-risk sexual behaviour, significant associations were observed between depression and time elapsed since last counselling (χ^2=14.70,

p<0.001), alcohol intake before sexual intercourse (χ^2=22.33, p<0.001), smoking before sexual intercourse (χ^2=5.338, p=0.021), condom use (χ^2=12.38, p<0.001) and number of sexual partners (χ^2=7.431, p=0.002). Participants who had not received recent counselling, consumed alcohol or tobacco before intercourse, did not use condoms or reported multiple sexual partners had a significantly higher prevalence of depression. Adherence to ART and duration of treatment were not significantly associated with depression on bivariate analysis.

Table 4: Association between socio-demographic profile and depression status among people living with HIV (n=380).

Variables		Depression status (%)		χ^2 and p value
		Absent 280 (73.7)	Present 100 (26.3)	
Gender	Male	215 (75.7)	69 (24.3)	χ^2=9.687 p=0.008*
	Female	65 (69.9)	28 (30.1)	
	Transgender	0 (0)	3 (100)	
Age groups in years	≤30	127 (72.6)	48 (27.4)	χ^2=0.207 p=0.649
	≥31	153 (74.6)	52 (25.4)	
Education	Illiterate	19 (65.5)	10 (34.5)	χ^2=3.688 p=0.595
	Primary school	52 (71.2)	21 (28.8)	
	Middle school	61 (80.3)	15 (19.7)	
	High school	47 (77)	14 (23)	
	Intermediate	45 (70.3)	19 (29.7)	
	Graduate/post graduate	56 (72.7)	21 (27.3)	
Occupation	Student	11 (55)	9 (45)	χ^2=21.663 p=0.006*
	Professional	27 (79.4)	07 (20.6)	
	Semi Professional	04 (50)	04 (50)	
	Clerical	08 (72.7)	03 (27.3)	
	Unskilled	81 (68.6)	37 (31.4)	
	Shop owner	12 (54.5)	10 (45.5)	
	Farmer	35 (92.1)	3 (7.9)	
	Skilled	33 (84.6)	06 (15.4)	
	Semi-skilled	69 (76.7)	21 (23.3)	
Socio-economic status	I upper class	51 (78.5)	14 (21.5)	χ^2=2.295 p=0.682
	II upper middle class	89 (71.2)	36 (28.8)	
	III middle class	82 (72.6)	31 (27.4)	
	IV lower middle class	46 (73)	17 (27)	
	V lower class	12 (85.7)	2 (14.3)	
Caste	General	142 (71.7)	56 (28.3)	χ^2=3.387 p=0.336
	OBC	94 (79.7)	24 (20.3)	
	Scheduled caste	40 (69)	18 (31)	
	Scheduled tribe	4 (66.7)	2 (33.3)	
Religion	Hindu	260 (74.9)	87 (25.1)	χ^2=3.285 p=0.350
	Muslim	13 (59.1)	9 (40.9)	
	Sikh	5 (62.5)	3 (37.5)	
	Christian	2 (66.7)	1 (33.3)	
Residence	Urban	164 (70.7)	68 (29.3)	χ^2=4.726 p=0.094
	Urban slum	19 (67.9)	9 (32.1)	
	Rural	97 (80.8)	23 (19.2)	
Marital status	Married	155 (79.5)	40 (20.5)	χ^2=24.50 p<0.001*
	Unmarried	112 (73.2)	41 (26.8)	
	Divorced	2 (33.3)	4 (66.7)	
	Widow	9 (52.9)	8 (47.1)	
	Separated	2 (22.2)	7 (77.8)	
Family type	Single	16 (53.3)	14 (46.7)	χ^2=12.38 p=0.002*
	Nuclear family	149 (71)	61 (29)	
	Joint family	115 (82.1)	25 (17.9)	

*-significantly associated.

Table 5: Association between high-risk sexual behaviour and depression status among people living with HIV (n=380).

Variables		Depression status		χ^2 and p value
		Present (%)	Absent (%)	
Adherence to ART	Non adherent	65 (77.4)	19 (22.6)	χ^2=0.76 p=0.383
	Adherent	215 (72.6)	81 (27.4)	
Time elapsed since last counselling	<1 month	60 (73.2)	22 (26.8)	χ^2=14.70 p<0.001*
	>3 month	70 (61.4)	44 (38.6)	
	1-3 months	150 (81.4)	34 (18.5)	
Duration of treatment	<1 year	55 (72.4)	21 (27.6)	χ^2=3.35 p=0.186
	1-4 year	110 (69.6)	31 (21.2)	
	>4 year	115 (78.8)	31 (21.2)	
Alcohol intake before sexual intercourse	Yes	25 (47.2)	28 (52.8)	χ^2=22.33 p<0.001*
	No	255 (78)	72 (22)	
Smoking status before sexual intercourse	Yes	60 (64.5)	33 (35.5)	χ^2=5.338 p=0.021*
	No	220 (76.7)	67 (23.3)	
Use of condom	Yes	176 (68.2)	82 (31.8)	χ^2=12.38 p<0.001*
	No	104 (85.2)	18 (14.8)	
Sexual Partners	Single sexual partner	164 (73.9)	58 (26.1)	χ^2=7.431 p=0.0024*
	Multiple sexual partner	29 (59.2)	20 (40.8)	
	Presently without partner	87 (79.8)	22 (20.2)	

*-significantly associated.

Table 6: Multiple linear regression analysis of factors associated with depression among PLHIV (n=380).

Variable	B (unstandardized coefficient)	Std. error	β (standardized coefficient)	t-value	P value
Age	0.065	0.524	0.006	1.091	0.276
Total stigma score	0.092	0.015	0.325	6.213	<0.001*
Gender	0.489	0.602	0.042	2.178	0.917
Caste	-0.012	0.321	-0.002	-0.038	0.970
Religion	0.268	0.576	0.023	0.465	0.642
Place of residence	-0.207	0.293	-0.036	-0.707	0.480
Education	0.061	0.169	0.019	0.360	0.719
Occupation	-0.404	0.113	-0.188	-3.571	<0.001*
Marital status	0.800	0.348	0.137	2.296	0.022*
Type of family	-1.248	0.443	-0.143	-2.820	0.005*
Socioeconomic class	-0.207	0.267	-0.042	-0.775	0.439
Adherence to ART	0.071	0.612	0.006	0.116	0.908
Time since last counselling	-0.212	0.323	-0.032	-0.658	0.511
Duration on treatment (years)	0.911	0.365	0.128	2.498	0.013*
Alcohol intake	-1.179	0.802	-0.078	-1.470	0.143
Tobacco intake	-0.831	0.643	-0.068	-1.292	0.197
Unprotected sexual intercourse	-0.595	0.587	-0.053	-1.014	0.311
Number of sexual partners	-0.924	0.345	-0.155	-2.677	0.008*

*-significantly associated.

On multiple linear regression analysis, total stigma score emerged as the strongest independent predictor of depression (β=0.325, p<0.001). Occupation (β=−0.188, p<0.001), marital status (β=0.137, p=0.022), family type (β=−0.143, p=0.005), duration on treatment (β=0.128, p=0.013) and number of sexual partners (β=−0.155, p=0.008) also showed significant independent associations with depression. Other socio-demographic and behavioural variables were not significant predictors after adjustment.

DISCUSSION

In this present study the prevalence of depression among the study participants. Out of 380 individuals living with HIV, 100 (26.3%) were found to have depression, while 280 (73.7%) did not show depressive symptoms. According to Charles et al 12% of people living with HIV/AIDS (PLHA) were found to be experiencing severe depression.[12] A study by Rai and Verma et al reported that the prevalence of anxiety among PLHA was 76.9%, while the prevalence of depression was 67.3%, with the majority of patients exhibiting moderate symptoms.[13] According to Bhatia et al, the prevalence of depression among HIV patients receiving ART was 58.75%.[14]

Similarly, a study by Madundo et al conducted at Kilimanjaro, Tanzania, the overall prevalence of depression among participants was 41%. This included 54 participants (20%) with moderate symptoms, 42 (15%) with moderately severe symptoms, and 16 (6%) with severe symptoms. The severity of depression was highest among participants diagnosed with HIV within the past month.[15]

In this study the majority of the participants (53.9%) were aged ≥31 years, while 46.1%were aged ≤30 years. In a study carried out by Sahu et al, the participants had a mean age of 36.42 years with a standard deviation of 10.29 years.[16] Similarly, Oke et al in their research conducted at Abeokuta, Nigeria, observed that the overall mean age of the respondents was 41.20±9.12 years.[17]

In this study the majority were male (74.7%), followed by female participants (24.5%), while 0.8% identified as transgender. Similarly, findings from Dutta et al in West Bengal revealed that males constituted 59.3% of the study participants.[18]

In our present study 20.2% were graduates, 20.2% had completed middle school, 19.2% had education up to primary school, 16.8% had studied up to the intermediate level, and 16.1% had completed high school, while 7.6% of the participants were illiterate. According to Sahu et al about 21.73% of the participants were illiterate.[16] In a study conducted by Charles et al in South India, it was reported that 11.2% of men and 17.5% of women were non-literate.[12]

In this study the majority of participants (32.9%) belonged to the upper middle class, followed closely by lower middle class (29.7%). Around 17.1% of participants were from the upper class, indicating that nearly one-fifth of the respondents had relatively higher socio-economic status. The upper lower class constituted 16.6%, while only 3.7% of participants were from the lower class. Similarly, Adhikari et al at Kolkata, using the BG Prasad socio-demographic scale (modified in 2018), classified 25.2%, 34.0%, 25.9%, 14.2%, and 0.7% of respondents into Classes I, II, III, IV, and V, respectively. Furthermore, 50.7% of participants reported a personal income below ₹5000 per month, 6.5% were non-income earners, and 2.0% identified their occupation as sex work. Additionally, 6.5% of respondents reported tobacco and/or alcohol use at the time of the study.[18]

In this study, the majority of participants were Hindu (91.3%), followed by Muslim (5.8%), Sikh (2.1%), and Christian (0.8%). This distribution reflects the predominant religious composition of the population in the study region of Gwalior. According to Dutta in West Bengal, the study revealed that the majority of participants (79.1%) were Hindus, while 10% were Muslims and 11.9% were 158 Christians.[17] In a study from Kolkata by Sarkar et al, it was observed that most participants were Hindus (80%), followed by Muslims (17.3%). Among the Hindu respondents, 51.1% belonged to the general category, while 22.2% were from the scheduled caste.[19]

In this study 258 (67.9%) reported using condoms during sexual intercourse, while 122 (32.1%) admitted to engaging in unprotected sexual intercourse. In a study conducted in Nepal, Bhatta et al. (2018) observed that approximately one-fourth of individuals living with HIV (26.0%, 95% CI: 17.2-34.7) reported having sexual intercourse without using a condom.[20] Similarly, in Botswana, Weiser et al found that 38% of respondents had engaged in unprotected sex within the past year, while only 12-13% of both men and women reported having unprotected sexual intercourse with a non-monogamous partner during the previous month.

In this study only 53 (13.9%) reported consuming alcohol before sexual intercourse, while the vast majority 327 (86.1%) denied such behaviour and 93 (24.5%) reported smoking prior to sexual intercourse, while 287 (75.5%) denied such behaviour. A study conducted in Nepal by Bhatta et al reported that among individuals living with HIV, approximately 26.5% were current tobacco users (95% CI: 18.9-34.1), whereas 22.7% (95% CI: 15.5 30.0) consumed alcohol.[20] Similarly, in Botswana, Weiser et al found that 38% of respondents had engaged in unprotected sex within the past year, while only 12-13% of both men and women reported having unprotected sexual intercourse with a non-monogamous partner during the previous month.[21].

The study strictly included participants only between the ages of 25 and 35 years. This narrow focus limits the generalizability of the findings to younger adolescents or older adults living with HIV. Some symptoms shared by both HIV disease progression and depression can potentially hinder the accuracy of diagnosis for depression in primary care settings, despite the use of standardized tools like the Hamilton depression scale (HAM-D).

CONCLUSION

Individuals whose last counselling session was more than three months ago (38.6%) experienced significantly higher depression compared to those counselled recently

($p<0.001$). The findings confirm that insufficient psychosocial support are powerful barriers negatively impacting the mental health and well-being of PLHIV. The lack of family support drastically increased depression risk; Behaviorally, alcohol intake before sexual intercourse (52.8%), tobacco intake before sexual intercourse (35.5%), engaging in unprotected sexual intercourse (31.8%), and having multiple sexual partners (40.8%) were all significantly associated with higher depression rates ($p<0.05$).

Recommendations

Depression significantly correlates with stigma, routine and mandatory screening for depression (using tools like HAM-D) and other mental health disorders should be integrated into ART Centre visits, particularly focusing on vulnerable groups (e.g., transgender individuals, separated/divorced patients). Strengthening family and social support, behavioral interventions and risk reduction.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee Approval no.- 1449/IEC-GRMC/2024; Dated: 01/05/2024 of Gajra Raja Medical College, Gwalior (MP)

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