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Original Research Article

Depression and its predictors among people living with HIV/AIDS on antiretroviral therapy

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ABSTRACT

Background: HIV infection is one of the raising public health problems. HIV diagnosis is usually associated with stigma and often results in mental illness among the people infected. Depression is the most common mental illness in HIV patients as found by various studies. Hence the present study aimed to determine the proportion of depression and its socio-demographic and clinical predictors among people living with HIV/AIDS (PLHA).
Methods: A hospital based cross sectional study was done among 322 PLHA on Antiretroviral therapy attending ART centre at GIMS Teaching Hospital, Gadag. After taking written informed consent from the patients, a predesigned proforma which included socio-demographic variables, clinical details, and CD-4 count, along with patient health questionnaire (PHQ) 9 was administered to assess depression in PLHA.
Results: Out of the 322 people living with HIV/AIDS, 108 (33.5%) had depressed. According to PHQ 9 questionnaire, 19.9% had mild depression, 10.6% moderate depression and 3.1% had moderate severe depression. It was noted that 40.3% of females had depression compared to 24.8% of males. PHLA who were on ART for less than one year had higher proportion of depression (61.1%) compared to those with 5 years duration of ART (28.6%) and it was statistically significant.
Conclusions: In the study 33.5% of PHLA had depression. Socio-economic status, gender, duration of ART had significant association with depression whereas age, education, place of residence, CD4 count were not associated with depression. Depression screening among PHLA can be done at regular follows ups at ART centres.

Keywords: Depression, PLHA, ART, PHQ 9

INTRODUCTION

HIV/AIDS which emerged in early 1980s, has evolved into global pandemic infecting millions of people worldwide. In India the prevalence of HIV infection in adults is 0.26% with 21.17 lakh PHLA.[1] The economically and reproductively active age group of 15-49 years account for 88% of HIV infection.[2] HIV infection is associated with stigma and once infected, a person remains HIV positive for lifelong which leads to psychological, medical, and socio-economic issues specific to the illness making HIV/AIDS stressful to manage. All these factors may affect the mental health of the PLHA leading to anxiety and depression.[3] Depression is the most common mental illness among HIV patients as reported by various studies.

Depression and HIV have complex relationship, detection and disclosure of HIV infection may lead to depression. On other hand, HIV infection can affect the brain leading to depression. Depression in PLHA may lead to increased risk behaviour and is associated with poor adherence to

antiretroviral therapy (ART) leading to HIV progression into AIDS.[3] In a developing country like India, factors such as low economic status, poor educational background, greater stigma, and inadequate social support have a crucial role in the development of depression during the course of the illness.[4] Depression among PLHA often goes undiagnosed and hence untreated dealing to poor quality of life.

In studies done in Ethiopia and Nigeria, prevalence of depression among PLHA was 41.2% and 23.1% respectively.[5,6] In India, the prevalence of depression among HIV infected people ranges from 47% to as high as 67% by different studies.[2,4,7] Research evidence suggests that the prevalence of depression among PLHA is higher compared to HIV negative controls.[7]

Hence assessment and management of depression among PLHA is essential for effective HIV/AIDS intervention program. So the present study was designed to determine the proportion of depression among PLHA on ART and to assess the socio-demographic and clinical variables associated with it. This study may help in providing baseline data regarding proportion of depression and its predictors which may help in better management of illness among PHLA, planning and policy making. As we have used patient health questionnaire (PHQ) 9 available in Kannada and Hindi languages, consisting of simple 9 questions, the methodology can be adapted for future studies.[8]

METHODS

Study design

A hospital based cross-sectional study was conducted among PLHA visiting ART centre at GIMS Teaching Hospital, Gadag, Karnataka.

Study period

The study period was 3 months from January 2018 to March 2018.

Sample size

A study conducted at community based organisation of Mangaluru had found 69% of depression among PLHA.[9] Using formula $n=4pq/d^2$ where p (prevalence)=69, q=100-p and d is error=8% we calculated a sample of 281, adding 10% as non- response rate we arrived at the sample size of 309 PLHA on ART. During the study period we interviewed a total of 322 PHLA on ART.

Ethical approval

The institutional ethics committee approval was obtained from the Gadag Institute of Medical Sciences, Gadag. Necessary permissions were obtained from the ART centre. Informed written consent in local Kannada language was taken from all the study participants for voluntary participation.

Data collection

People living with HIV/ AIDS on ART aged 18years and above, who gave consent, were included in the study. PLHA suffering from acute illness requiring emergency treatment were excluded from the study. After taking written informed consent, a pretested proforma having socio-demographic variables, clinical details, CD4 count and PHQ9 questionnaire in Kannada and Hindi languages was used to assess depression among PHLA.[8]

Study tool

PHQ 9 is validated for use in primary care. It is one of the widely used depression screening questionnaire, it can be self-administered and utilizes a scoring method to specifically measure depression-related symptoms. PHQ 9 has 88% sensitivity and 88% specificity for major depression. PHQ 9 includes questions on interest in life, feeling sad and hopeless, sleep and eating habits, concentration and energy levels and thoughts of dying over the last two weeks. PHQ 9 questionnaire translations in nearly 80 languages (including Kannada & Hindi) are available. PHQ 9 is the depression module, which scores each of the 9 Diagnostic and Statistical Manual of Mental Disorders- IV criteria by Likhert scale, as "0" (not at all), "1" (several days), "2" (more than half the days) and "3" (nearly every day). The total scores of PHQ 9 range from zero to 27. A positive depression screen was defined as a score greater than 9. Based on their responses PLHA were categorized into five categories as follows:

PHQ-9 scores of 1- 4: no depression, 5-9: mild depression, 10-14: moderate depression, 15-19: moderately severe depression, ≥20: severe depression.[8,10]

Adherence to ART is the extent by which patient adhered to the treatment regimen during a particular time. Adherence was calculated as per National AIDS Control Organization guidelines by pill count method based on average monthly consumption of ART.[11]

Adherence (%)

$$= \frac{\text{Total number of pills the patient has actually taken}}{\textit{Total number of pills the patient should have taken in the time period}} \times 100$$

Or Adherence (%)

$$= \frac{\text{Number of pills given to the client} - \text{number of pills balance in the bottle}}{\textit{Number of pills the client should have taken in the time period}} \times 100$$

Statistical analysis

Data was compiled in Excel Sheet and analyzed in SPSS-16 software. Socio-demographic variables were analyzed using Proportions and association between depression

and socio-demographic, clinical variables were analysed using Chi-square test.

RESULTS

In this study, out of 322 study participants, 104 (38.5%) were in the age group of 34-43 years. Majority of PLHA, 181 (56.2%) were females and 141 (43.8%) were males. According to marital status, majority 181 (56.2%) were married, 107 (33.2%) were widows and 18 (5.6%) had a divorce. Most of the study participants 243 (75.5%) were from rural areas. It was found that 199 (61.8%) PLHA were literates and 123 (38.2%) were illiterates. Among the study participants, 267 (82.9%) were currently employed and 137 (42.5%) belonged to lower socio-economic class V according to the modified B G Prasad classification (Table 1).

Table 1: Socio-demographic profile of PLHA.

Variable	Category	Frequency	%
Age (in years)	18-23	12	3.7
	24-28	40	12.4
	29-33	47	14.6
	34-38	63	19.6
	39-43	61	18.9
	44-48	44	13.7
	49-53	24	7.5
	54-58	10	3.1
	>59	21	6.5
Gender	Male	141	43.8
	Female	181	56.2
Education	Illiterate	123	38.2
	Primary school	97	30.1
	Secondary school	60	18.6
	College and above	42	13.1
Occupati-onal status	Unemployed	33	10.2
	Working	267	83.0
	Previously working	22	6.8
Socio-economic status	Lower	137	42.5
	Upper lower	130	40.4
	Lower middle	46	14.3
	Upper middle	9	2.8
	Upper	0	0
Marital status	Married	181	56.2
	Single	15	4.7
	Divorce	18	5.6
	Widow	107	33.2
	living	1	0.3
Place of residence	Rural	243	75.5
	urban	79	24.5

Table 2 depicts that time since diagnosis of HIV infection was more than 5 years among 154 (47.8%) of PHLA and majority 290 (90.1%) of PLHA were on TDF+3TC+EFC (Tenofovir + Lamivudine + Efavireniz) ART regimen. Duration of ART was more than 5 years among 147 (45.7%) PLHA, followed by 70 (21.7%) were on ART for 3-5years and 69 (21.4%) were on ART for 1-3 years. All (100%) of study participants had received pre and posttest counseling. Adherence to ART regimen was 100% among 252 (78.2%) PLHA, less than 50% adherence was noted in 6 (1.9%) of PLHA.

Table 2: Treatment profile among PLHA.

Variable	Category	Frequency	%
ART treatment	TDF+3TC+EFV	290	90.1
	AZT+3TC+NVP	30	9.3
	AZT+3TC+EFV	0	0
	TDF+3TC+NVP	2	0.6
Time since diagnosed (year)	<1	29	9.0
	1-3	66	20.5
	3-5	73	22.7
	>5	154	47.8
Duration of ART	<1	36	11.2
	1-3	69	21.4
	3-5	70	21.7
	>5	147	45.7
Treatment taken	Regularly	321	99.7
	irregularly	1	0.3
Counselling	Given	322	100
	Not given	0	0
Adherence to ART	<50	6	1.9
	50-75	13	4
	75-99	51	15.8
	=100	252	78.3

*TDF+3TC+EFV-Tenofovir+Lamivudine+Efavireniz
AZT+3TC+NVP - Zidovudine+Lamivudine+Nevirapine
AZT+3TC+EFV - Zidovudine+Lamivudine+Efavireniz
TDF+3TC+NVP - Tenofovir+Lamivudine+Nevirapine.

Table 3: CD4 count among PLHA.

Variable	Category (cells/µl)	Frequency	%
CD4 count	<200	28	8.7
	200-500	129	40.1
	500-800	88	27.3
	>800	77	23.9
Total		322	100

CD4 cell count of less than 200 cells/µl was reported in 28 (8.7%) PHLA, CD4 cell count was 200-500 cells/µl among 129 (40.1%) PLHA, 88 (27.3%) study participants had CD4 count between 500-800 µl/ and 77 (23.9%) had CD4 count of more than 800 cells/µl (Table 3).

Overall 108 (33.5%) PLHA had depression according to PHQ 9 questionnaire (Figure 1) among them 64 (19.9%) had mild depression, 34(10.5%) moderate and 10(3.1%) had moderately severe depression (Table 4).

Table 4: Grading of depression among PLHA on ART treatment.

Variable	Category	Frequency	%
Depression grade	None (0-4)	214	66.5
	Mild (5-9)	64	19.9
	Moderate (10-14)	34	10.5
	Moderately severe (15-19)	10	3.1
	Severe (20-27)	0	0
Total		322	100

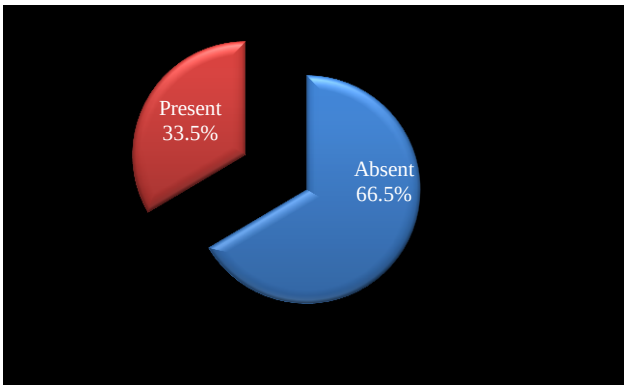

Figure 1: Depression among PLHA on ART treatment.

Table 5: Association of depression among PLHA with gender.

Gender	Depression		
	None (%)	Present (%)	Total (%)
Male	106 (75.2)	35 (24.8)	141 (100)
Female	108 (59.7)	73 (40.3)	181 (100)
Total	214 (66.5)	108 (33.5)	322 (100)

χ^2= 8.552 df=3 p=0.003

Table 6: Association of Depression among PLHA with socio-economic status

Socio-economic status	Depression		
	None (%)	Present (%)	Total (%)
Class V	105 (76.6)	32 (23.4)	137 (100)
Class IV	77 (59.2)	53 (40.8)	130 (100)
Class III	26 (56.5)	20 (43.5)	46 (100)
Class II	6 (66.7)	3 (33.3)	9 (100)
Total	214 (66.5)	108 (33.5)	322 (100)

χ^2= 11.459 df=3 p=0.009.

In the study depression was more common among females with 74 (40.3%) of them having depression compared to 53 (24.8%) males having depression, which was statistically significant (p=0.003) (Table 5). Socio-economic status was significantly associated with depression (p=0.009), as middle class PLHA had highest percentage of depression (43.5%) followed by 40.8% and 23.4% depression among PLHA belonging to lower middle and lower socioeconomic groups respectively (Table 6).

Table 7: Association of depression among PLHA with time since diagnosis.

Time since diagnosis	Depression		
	None (%)	Present (%)	Total (%)
<1 years	10 (34.5)	19 (65.5)	29 (100)
1-3 years	42 (63.6)	24 (36.4)	66 (100)
3-5 years	52 (71.2)	21 (28.8)	73 (100)
>5 years	110 (71.4)	44 (28.6)	154 (100)
Total	214 (66.5)	108 (33.5)	322 (100)

χ^2= 15.991 df=3 p=0.001

Table 8: Association of depression among PLHA with duration of treatment.

Time of ART	Depression		
	None	Present	Total
<1 years	14 (38.9)	22 (61.1)	36 (100)
1-3 years	44 (63.8)	25 (36.2)	67 (100)
3-5 years	51 (72.9)	19 (27.1)	70 (100)
>5 years	105 (71.4)	42 (28.6)	147 (100)
Total	214 (66.5)	108 (33.5)	322 (100)

χ^2= 15.414, df=3, p=0.001

Table 7 shows depression was statistically more among PLHA who were diagnosed in the recent one year period (65.5%) compared to 28.6% depression among PLHA who were diagnosed with HIV for more than 5 years (p=0.001). Similarly statistically association was found between depression and duration of ART, with 61.1% of PLHA who were on ART for less than 1 year had depression compared to 28.6% depression among PLHA who were on treatment for more than 5 years (p=0.0001) (Table 8).

Out of 322 study participants, 46 (14.3%) were on tuberculosis treatment. Of the 46 PLHA who were on TB treatment 12 (26.1%) were depressed compared to 96 (34.8%) of 276 PLHA who were not on TB treatment but this was not statistically significant. Among the 50 PLHA who were current smoker 24(48%) were depressed whereas 14 (17.9%) of 78 PLHA who never smoked had depression, again depression was high among past smokers as 70 (36.1%) of 194 PLHA with past history of smoking had depression which was statistically significant. Habitual alcohol consumption was seen in 14 (4.3%), 45 (14%) consumed alcohol occasionally, 231 (71.7%) never consumed alcohol and 32 (9.9%) had history of alcohol consumption in the past (Table 9). In the study no significant association was found between depression and age, place of residence, marital status, and CD4 cell count of the PHLA.

Table 9: Association of depression among PLHA with TB treatment, smoking and alcohol consumption.

Variable	Category	Depression		Total	p value
		Absent (%)	Present (%)		
Tuberculosis treatment	Taken	34 (73.9)	12 (26.1)	46 (100.0)	χ^2=1.337 df=1 p=0.247
	Not taken	180 (65.2)	96 (34.8)	276 (100.0)	
Smoker	Current	26 (52.0)	24 (48.0)	50 (100.0)	χ^2=13.759 df=2 p=0.001*
	Never	64 (82.1)	14 (17.9)	78 (100.0)	
	Past	124 (63.9)	70 (36.1)	194 (100.0)	
Alcohol consumption	Habitual	11 (78.6)	3 (21.4)	14 (100)	χ^2=4.34 df=3 p=0.222
	Occasional	35 (77.8)	10 (22.2)	45 (100)	
	Never	147 (63.6)	84 (36.4)	231 (100)	
	In past	21 (65.6)	11 (34.4)	32 (100.0)	
Total		214 (66.5)	108 (33.5)	322 (100.0)	*Significant

DISCUSSION

Prevalence of depression among HIV-infected people was found to be 47%-69% in India according to various studies by NACO, Bhat et al and Rai et al.[2,4,7] Depression among PLHA in the study was 33.5%, which was similar to the findings of 30% depression among clinically stable PLHA at ART centre of Thissur government medical college.[12] A study done at Aligarh using PHQ 9 questionnaire found 16.1% of PLHA were suffering from depression with 13.1% having mild, 2.3% moderate and 0.7% moderately-severe depression, whereas in this study 19.9% of study participants had mild depression, 10.5% moderate and 3.1% had moderately severe depression.[13]

This study revealed that among PHLA, proportion of depression was more among females 40.3% compared to males 24.8%, which was statistically significant (p=0.003) which was similar to studies done by Chandra et al and Dhadphale et al in India.[14,15]

A study done at ART centre of tertiary care hospital found 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%), in our study also socio-economic status was significantly associated with depression (p=0.009), but PLHA belonging to middle class showed highest percentage of depression (43.5%) followed by 40.8% and 23.4% depression among PLHA belonging to lower middle and lower socioeconomic groups respectively, may because middle class PLHA were more worried about of societal reaction to their positive HIV status.[16]

The study showed no significant association between depression and age, place of residence, education, and marital status of the respondents. Almost similar results have also been found by Khan et al and few other studies.[9,15,17]

The present study revealed that 8.7% of PLHA had CD4 cells count of less than 200 cells/µl, 40.1% reported CD4 cell count of 200-500 cells/µl, 27.3% had CD4 count between 500-800/µl and 23.9% had CD4 count of more than 800 cells/µl. A study done ART centre Jhansi, Uttar Pradesh found 63.6% of PLHA had CD4 count above 300 cells/µl and 36.54% had CD 4 count below 300 cells/µl.[7] No statistical association was found between CD4 count and depression in the present study which was similar to findings of study at Jhansi and few other studies.[7,12,16]

Proportion of Depression was 65.5% among PLHA with less than one year of illness compared to 28.6% among PLHA with 5 years of illness, which was statistically significant (p=0.001). Similarly duration of ART was statistically associated with depression, as 61.1% of PLHA on ART for less than 1 year had depression compared to 28.6% of depression among PLHA who were on treatment for more than 5 years, but in other studies duration of illness or duration of ART were not associated with depression.[7,12]

CONCLUSION

Depression screening is vital among PHLA on antiretroviral therapy, using PHQ 9 33.5% of PLHA were diagnosed with depression among which 19.1% had mild depression, 10.5% suffered from moderate depression and 3.1% with moderately severe depression. Proportion of depression was more among females may because they are more worried and insecure about their family and societal reaction to their positive status. It may be difficult to cope mentally with positive HIV status in the recent year of diagnosis, as PLHA with less than one year of diagnosis and less than one year of ART had higher proportion of depression compared to PLHA with five or more years of diagnosis and ART. Socio-economic status, gender and smoking also had significant association with depression among PLHA.

Recommendations

Depression being high in PLHA, screening for depression may be done at the time of diagnosis at Integrated Counselling and Testing Centre and necessary counselling and treatment may be provided for those with depression. Periodic screening and follow up for

depression may also be carried out at follow up visit to ART centre which may help in early diagnosis and treatment of depression among PLHA, which may in turn improve the quality of life of PLHA.

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