*International Journal of Science and Healthcare Research*
*Vol. 8; Issue: 2; April-June 2023*
*Website: ijshr.com*
*Original Research Article* *ISSN: 2455-7587*

# Relationship Among CD4 Count, Symptoms Experience and Depression in People Living With HIV/AIDS (PLHIV)

**Panduranga Dyamanna Adagal[1], Dr. Shriharsha C[2], Dr. Deelip S Natekar[3], Treesa Joseph[4], Rathod Anil Basu[5]**

[1]M.Sc. Nursing final year, Shri B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot, Karnataka
[2]Professor and HOD, Department of Psychiatric Nursing, Shri B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot, Karnataka
[3]Principal, Shri B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot, Karnataka
[4]Assistant Professor, Department of Psychiatric Nursing, Shri B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot, Karnataka
[5]Lecturer, Department of Psychiatric Nursing, Shri B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot, Karnataka

Corresponding Author: Dr. Shriharsha C

**DOI: https://doi.org/10.52403/ijshr.20230203**

## ABSTRACT

**Background:** Depression is common in people living with HIV/AIDS and there is some evidence that depressive symptoms may have adverse effects on immune functioning. The aim of the study was to assess the CD4 count; Symptoms experience and Depression among HIV/AIDS patients attending the ART centre district government Hospital, Navanagar, Bagalkot.
**Methodology:** This was a cross sectional study with a convenient sample of 230 PLHIV attending the ART Centre, District Government Hospital, Bagalkot Symptoms Experience was assessed using Revised Sign and Symptom Checklist for HIV (SSC-HIV rev) and depression was assessed using Centre for Epidemiological Studies Depression Scale (CES-D), CD4 count was taken from medical records of PLHIV. Data were analyzed using descriptive and inferential statistics.
**Findings:** Results indicate, majority (51.3%) PLHIV hadCD4 less than 500 cells/ $mm^3$with mean of CD4count score 553.76 ±262.44. Majority (88.7%) of PLHIV had moderate symptoms experience and most (95.2%) of them had significant clinical depression. There was a significant positive correlation between depression and symptoms experience ($r = 0.588$, $P<0.01$), but no significant correlation found between CD4 count and symptoms experiences and CD4 count and depression.
**Conclusion:** The finding of the study concludes depression will have negative impact on patients' clinical symptoms and CD4 count. Hence along with the medical management of PLHIV underlying depression should be treated meticulously.

***Key words:*** CD4 count, Symptoms experience, Depression, People living with HIV/AIDS.

## INTRODUCTION

The past few years, HIV and AIDS became one of the most feared aspects in the medical science when it comes to diseases and causative agents. The deterioration in the morality and lifestyle modifications of the current generation four folds the complexity of the situation. The increased infidelity rates, ignorance regarding the disease and unsafe sex practices among sex workers, teenagers, and even educated adults increases the severity of the condition[1].

HIV/AIDS is without doubt the worst epidemic to hit humankind since the Black Death. As of 2021 an estimated 40 million

people were living with this disease worldwide, and about 20 million had died. In the developing world, especially in parts of Africa, life expectancy has plummeted to below 35 years, causing a serious decline in economic growth, a sharp increase in orphans, and the imminent collapse of health care systems. Because the disease is so closely linked to sexual activity and drug use, the need to understand and change behavior has caused us to reassess what it means to be human[2].

India is one of the largest and most populated countries in the world, with over one billion inhabitants. Of this number, it's estimated that around 2.4 million people are currently living with HIV. Having a population of around a billion, an increase in 0.1% of HIV prevalence would mean an increase by over half a million in the HIV-infected patients. The current estimated adult HIV prevalence is 0.27%.[3]

The burden of HIV infection is high among people who inject drugs in India and was increasing in cities where injecting drug abuse was already a problem. This means that there is a huge unmet need both in diagnosis and access to care therapy for people who are HIV positive[4].

One of the most common mental health conditions that people living with HIV face is depression. Depression can range from mild to severe, and the symptoms of depression can affect your day-to-day life[5].

CD4 cells are white blood cells that play an important role in the immune system. When a person is living with HIV, the virus attacks the CD4 cells in their blood. This process damages CD4 cells and causes the number of them in the body to drop, making it difficult to fight infections. CD4 cells are sometimes also called T-cells, T-lymphocytes, or helper cells. The CD4 cell count of a person who does not have HIV can be anything between 500 and 1500. People living with HIV who have a CD4 count over 500 are usually in pretty good health. People living with HIV who have a CD4 cell count below 200 are at high risk of developing serious illnesses[6]. Depression significantly affects the CD4 count in PLHIV and hence increases their symptoms experience.

## MATERIALS AND METHODS

### Study design and Participants

The present study was a descriptive cross sectional survey design conducted with a convenient sample of 230 people living with HIV/AIDS attending ART centre, District Government Hospital, Navanagar, Bagalkot who are willing to participate in the study and present at the time of data collection.

### Instruments:

**Revised Sign and Symptom Checklist for HIV (SSC-HIV rev):** Severity of symptoms experience among PLHIV was assessed using Revised Sign and Symptom Checklist for HIV (SSC-HIV rev) which consists of 45 items with score ranging from 0-135.

Canter for Epidemiological Studies Depression Scale (CES-D): Severity of depressive symptoms among PLHIV was assessed using CES D scale which has 20 items with score ranging from 0-60.

### Data collection procedures:

Prior permission was taken from KSAPS (Karnataka State AIDS Prevention Society) Bangalore, Karnataka before the beginning of data collection. Every HIV/AIDS patient who fulfilled the inclusion criteria was approached for data collection. Consent was obtained by the participants before they underwent the questionnaires. Purpose of the study was explained to the participants and they were asked questions in Kannada or in the language understandable to them. All the information collected was based on participants self-report.

### Data analysis:

The data obtained were analyzed in terms of the objectives of the study using descriptive and inferential statistics. A master data sheet was prepared with responses given by the participants. Frequency and percentage of demographic data were analysed. The mean and standard deviation of study variables

were calculated. The Pearson's correlation coefficient was computed to find the relationship between CD4 count, symptom experience and depression. The Chi Square test was used to determine association between CD4 count symptoms experiences and depression with selected socio-demographic variables.

**Ethical clearance:**

Ethical clearance was obtained from the institutional ethical committee of BVVS Sajjalashree Institute of Nursing Sciences, Bagalkot.

## RESULTS

**Sample Characteristics**

Percentagewise distribution of HIV/AIDS patients according to their socio demographic variables reveal that, most (41.3%) of PLHIV were aged between 41-50years, more (59.1%) number of PLHIV were females. 59.1% of PLHIV were belonging to Hindu religion. Majority of (93.9%) PLHIV were illiterate. 42.17% of PLHIV were married. Majority of (81%) PLHIV were having children. 82% of PLHIV were doing labour work. 37% of PLHIV were living in Rural area. 80.9% of PLHIV had their income between Rs.10,001-Rs. 20,000/- per month. 71.7% of PLHIV were belonging to joint family. 51.3% of PLHIV were having CD4 count between 501-1000 cells. Majority (65.7%) of PLHIV were unknown of thier mode of HIV transmission, 38.3% of PLHIV had 6-10years of duration of time with HIV.Majority (76.5%) of PLHIV were in the second stage of HIV illness.

**Table 1: Levels of CD4 count among PLHIV. N=230**

| Levels of CD4 count | Range of Score | No of respondents | Percentage (%) |
|---|---|---|---|
| < 500 | <500 | 100 | 43.5% |
| 501-1000 | 501-1000 | 118 | 51.3% |
| And above 1000 | And above 1000 | 12 | 5.2% |

Assessment of levels of CD4 count among PLHIV reveals that, majority (51.3%), of PLHIV had 501-1000 cells/mm3, 43.5% of them were < 500 cells/ $mm^3$and remaining only 5.2% of were above 1000cells (Table- 1).

**Table-2 Levels of Symptoms experiences among PLHI5V.**

| Symptoms experiences | Range of Score | No of respondents | Percentage (%) |
|---|---|---|---|
| Mild symptoms | 0-45 | 25 | 10.9% |
| Moderate symptoms | 46-90 | 204 | 88.7% |
| Severe symptoms | 91-135 | 1 | 0.4% |

Assessment of levels of Symptoms experiences among PLHIV reveals that, majority (88.7%) of PLHIV had moderate symptoms, 10.9% of them had mild symptoms and only 0.4% PLHIV had severe symptoms. (Table-2).

**Table-3 Levels of Depression among PLHIV.**

| Symptoms experiences | Range of Score | No of respondents | Percentage (%) |
|---|---|---|---|
| Mild depression/ No clinical significant depression | < 16 | 11 | 4.8% |
| Moderate depression/clinical significant depression | 16 and above | 219 | 95.2% |

Assessment of levels of Depression among PLHIV reveals that, 95.2%of PLHIV had moderate depression/ clinical significant depression and remaining 4.8% were had mild depression/ no clinical significant depression (Table-3).

**Table 4: Mean and SD of CD4 count, Symptoms experiences score and Depression among PLHIV.**

| Area | Maximum Score | Minimum Score | Mean | S. D |
|---|---|---|---|---|
| CD4 count | 1558 | 24 | 553.76 | 262.466 |
| Symptoms experiences | 92 | 11 | 62.61 | 14.277 |
| Depression | 52 | 11 | 34.01 | 8.322 |

Result depicts that maximum score of CD4 count among PLHIV is 1558 and minimum score is 24. The mean and SD of CD4 count score is 553.76±262.466. Maximum score of Symptoms experiences is 92and minimum score is 11. The mean and SD of Symptoms experience score is 62.61±14277 and Maximum score of Depression is 52and minimum score is 11 The mean and SD of Depression score is 34.01±8322.

**Table 5: Correlation between CD4 count, Symptoms experiences and Depression among PLHIV.**

| Correlation between CD4 count and Symptoms experience and Depression | | |
|---|---|---|
| Variables | CD4 count | Symptoms experiences |
| Symptoms experiences | -0.109 | _ |
| Depression | -0.058 | 0.588** |

****P<0.01, 0.3-0.5 indicates moderate correlation, 0.5-0.7 indicates large correlation, 0.7-0.9 indicates very large correlation.**

Results displays that, Depression and Symptoms experiences were significantly positively correlated (r = 0.588**) indicating increase in symptoms experiences, increasing the depression, There was not significant correlation between CD4 count and symptoms experiences and CD4 count and depression.

**Part-VI: Table 5.6: Association of CD4 count with socio-demographic and clinical characteristics of PLHIV. N=230**

| Sl no | Categorical variables | Chi-Square value ($\chi^2$) | DF | P values |
|---|---|---|---|---|
| 1 | Age | 11.457 | 8 | 0.177 |
| 2 | Gender | 6.531 | 2 | 0.038* |
| 3 | Religion | 2.716 | 2 | 0.257 |
| 4 | Educational status | 10.075 | 10 | 0.434 |
| 5 | Marital status | .960 | 2 | 0.619 |
| 6 | Having children | 6.642 | 2 | 0.036 |
| 7 | Occupation | 13.875 | 14 | 0.459 |
| 8 | Type of family | 3.595 | 2 | 0.166 |
| 9 | Area of residence | 2.013 | 2 | 0.365 |
| 10 | Family history of HIV | 8.452 | 2 | 0.015* |
| 11 | Mode of HIV transmission | 4.397 | 2 | 0.111 |
| 12 | Duration of illness | 4.477 | 4 | 0.345 |
| 13 | WHO clinical staging | 9.049 | 6 | 0.171 |

****P<0.005 (significant)**

Table 5.6: reveals the association between CD4 Count &socio-demographic and clinical characteristics of PLHIV. Findings depict that, there is were significant association found between CD4 Count and socio-demographic gender and clinical characteristic family history of HIV of PLHIV Gender [$\chi^2$=6.531, P< 0.05] and Family history of HIV [$\chi^2$=8.452 P< 0.05]

**$H_1$:** is accepted for all socio demographic variables gender and clinical Characteristic family history and for other variable.

## Section D: Association between symptoms experiences and categorical socio-demographic and clinical characteristics of PLHIV.

**Table 5.7: Association between symptoms experiences and categorical socio-demographic and clinical characteristics of PLHIV. N=230**

| Sl no | Variables | Chi-Square value ($\chi^2$) | DF | P values |
|---|---|---|---|---|
| 1 | Age | 6.878[a] | 8 | 0.550 |
| 2 | Gender | 3.290[a] | 2 | 0.193 |
| 3 | Religion | 1.900[a] | 2 | 0.387 |
| 4 | Educational status | 4.164[a] | 10 | 0.940 |
| 5 | Marital status | .735[a] | 2 | 0.693 |
| 6 | Having children | .276[a] | 2 | 0.871 |
| 7 | Occupation | 9.716[a] | 14 | 0.784 |
| 8 | Type of family | 5.373[a] | 2 | 0.068 |
| 9 | Area of residence | 1.638[a] | 2 | 0.441 |
| 10 | Family history of HIV | 1.718[a] | 2 | 0.387 |
| 11 | Mode of HIV transmission | 1.897[a] | 2 | 0.613 |
| 12 | Duration illness | 2.419[a] | 4 | 0.659 |
| 13 | WHO clinical staging | 15.388[a] | 6 | 0.017 |

***P<0.01**

Result reveals that association between symptoms experience &socio-demographic and clinical characteristics of PLHIV. Findings depict that, there is no significant association found between symptoms experience and any of the socio-demographic and clinical characteristics of PLHIV. $H_2$: is rejected for all socio demographic and clinical characteristic variables (Table 5.7).

**Table 5.8: Association between Depression and categorical socio-demographic and clinical characteristics of PLHIV. N=230**

| Sl no | Variables | Chi-Square value ($\chi^2$) | DF | P values |
|---|---|---|---|---|
| 1 | Age | 4.407[a] | 4 | 0.354 |
| 2 | Gender | .100[a] | 1 | 0.751 |
| 3 | Religion | .749[a] | 1 | 0.387 |
| 4 | Educational status | 14.915[a] | 5 | 0.011 |
| 5 | Marital status | .701[a] | 1 | 0.402 |
| 6 | Having children | .629[a] | 1 | 0.428 |
| 7 | Occupation | 4.854[a] | 7 | 0.678 |
| 8 | Type of family | 10.130[a] | 1 | 0.088 |
| 9 | Area of residence | .495[a] | 1 | 0.482 |
| 10 | Family history of HIV | 2.913[a] | 1 | 0.845 |
| 11 | Mode of HIV transmission | .256[a] | 1 | 0.613 |
| 12 | Duration illness | .925[a] | 2 | 0.630 |
| 13 | WHO clinical staging | 2.946[a] | 3 | 0.400 |

***P<0.01**

Result depicts that Association between depression &socio-demographic and clinical characteristics of PLHIV. Findings depict that, there was a significant association found between education and depression [$\chi^2$=14.915, P< 0.01] Therefore $H_3$: is accepted for this socio demographic variable educational status and clinical characteristic, Therefore $H_4$: is rejected for remaining socio demographic and clinical characteristic variables (Table 5.8).

## DISCUSSION

This cross sectional study included a sample of 230 PLHIV attending the ART centre, District Government Hospital, Bagalkot to assessCD4 count, Symptoms experiences and Depression and their determinants among HIV/AIDS patients. The percentage wise distribution of sample according to their age shows that, majority 41.3% of PLHIV were aged between 41-50yrs, majority of gender PLHIV (59.1%) were females, majority (93.9%) of PLHIV was belonging to Hindu religion, majority of (42.17%) of PLHIV were illiterate.

The percentage wise distribution of PLHIV according to their marital status shows that, most of the (81%) PLHIV were married, majority of the PLHIV (82%) had children. Majority of occupation (37%) of PLHIV were coolie, majority (71.7%) of had their family monthly income is above Rs 10000.

Findings of present study are consistent and supported with the study conducted by Charles B et al (2021), findings of this study shows that, most of the PLHIV (81%) were married.[7]

The percentage wise distribution of PLHIV according to their type of family reveals that majority of the PLHIV 57% was belonging to joint family. Majority of PLHIV 80.9% were residing in to rural area.

The distribution of PLHIV according their CD4 count depicts that, majority 51.3% of them were having CD4 count between 501-1000 cells. The more number of PLHIV (57.4%) of them had no family history. Majority of PLHIV their mode of HIV transmission (65.7%) were unknown of mode,Majority (38.3) of PLHIV had 6-10yrs of duration. Majority of PLHIV according to their WHO clinical staging 76.5% were in the second stage of illness.

The distribution of PLHIV according their CD4 count depicts that, majority (51.3%) of them were having CD4 count between 501-1000 cells and finding the CD4 count mean and SD of score is 553.76±262.466.

Findings of present study are consist and supported with the study conducted by Charles B et al (2021)[7], findings of this study revealed that, majority 88.7%of

PLHIV had moderate symptoms and the symptoms experience mean and SD score is 62.61±14277.

Findings of present study are consistent and supported with the study conducted by Charles B et al (2021), result depicts that majority 90% of PLHIV had moderate symptoms[7],

Findings of the present study revealed that, majority 95.2% of PLHIV had moderate depression and the mean and SD of Depression score is34.01±8322.

Correlation between Depression and Symptoms experiences were significantly positively correlated (r = 0.588**) indicating increase in symptoms experiences increasing the depression, There was not significant correlation between CD4 count and symptoms experiences and CD4 count and depression.

The findings of the present study are consistent and supported with the study conducted by Fang X, Vincent W, Calabrese SK, et al (2015). Result shows that, there is no significant correlation between CD4 count and depression and CD4 count and symptoms experiences among PLHIV/ AIDS[8].

Findings revealed that, There is a significant association found between CD4 Count and socio-demographic gender and clinical characteristic family history of HIV of PLHIV Gender [$\chi^2$=6.531, P< 0.05] and Family history of HIV [$\chi^2$=8.452 P< 0.05].

The finding of the present study are consist with the study conducted by Qin P, He J, Yang X, et al (2022), Result shows that association between CD4 count with socio-demographic and clinical characteristics of PLHIV/AIDS, gender with socio-demographic and family history with clinical characteristics variable are associated of PLHIV/AIDS.[9]

Findings revealed that, there is no significant association found between symptoms experience and any of the socio-demographic and clinical characteristics of PLHIV.

The finding of the present study are consist with the study conducted by Qin P, He J, Yang X, et al (2022), result shows there is no significant association between symptoms experiences and socio-demographic variable of PLHIV.[9]

Findings of the present study revealed that, there is a significant association found between education and depression [$\chi^2$=14.915, P< 0.01]. Findings of present study are consistent and supported with the study conducted by Charles B et al (2021). Result shows that, there is a significant association found between, education and depression.[7]

## CONCLUSION

The study is helpful to assess the relationship between CD4 count, Symptoms experiences and Depression among PLHIV attending ART centre, Government Hospital, Navanagar, Bagalkot. Future researches can investigate the effect of various psychological measures to reduce the symptoms experiences and Depression among PLHIV.

### *Declaration by Authors*

**Ethical Approval:** Approved

**Acknowledgement:** None

**Source of Funding:** None

**Conflict of Interest:** The authors declare no conflict of interest.

## REFERENCES

1. Cecil, Russell L. Cecil Textbook of Medicine 1881-1965: Internet Archive. Philadelphia: W.B. Saunders; 1970 [cited 2023Mar27]. Available from: https://archive.org/details/ceciltextbookofm00ceci.
2. Evaluation of the health economics and HIV and AIDS research division ... [Internet]. [cited 2023Mar27]. Available from: https://cdn.sida.se/publications/files/sida62047en-evaluation-of-the-health-economics-and-hiv-and-aids-research-division-heard.pdf
3. Gulani KK. A Text Book of Community Health Nursing. 3rd ed. New Delhi, New Delhi: Kumar Publishing House; 2019. Page No. 653

4. Solomon S, Kumarasamy N, Challacombe SJ. The social impact of HIV/AIDS in India. Oral Diseases. 2016;22:15–8.
5. HIV and mental health [Internet]. HIV.gov. [cited 2023Mar27]. Available from: https://www.hiv.gov/hiv-basics/staying-in-hiv-care/other-related-health-issues/mental-health
6. Moncivaiz A. CD4 count: Normal range, viral load, and what it means for people [Internet]. Healthline. Healthline Media; 2021 [cited 2023Mar27]. Available from: https://www.healthline.com/health/hiv-aids/cd4-viral-count.
7. Charles B, Jeyaseelan L, Pandian AK, Sam AE, Thenmozhi M, Jayaseelan V. Association between stigma, depression and quality of life of people living with HIV/AIDS (PLHA) in South India - a community based cross sectional study. *BMC Public Health*. 2021;12:463.
8. Fang X, Vincent W, Calabrese SK, et al. Resilience, stress, and life quality in older adults living with HIV/AIDS. *Aging Ment Health*. 2015;19(11):1015-1021.
9. Qin P, He J, Yang X, et al. The Role of Depressive Symptoms and Physical Activity Levels in Mediating the Association Between HIV Status and Neurocognitive Functions Among Individuals Aged at Least 50 Years in China: Cross-sectional Study. *JMIR Public Health Surveill*. 2022; 8(8):e32968.

How to cite this article: Panduranga Dyamanna Adagal, Shriharsha C, Deelip S Natekar. Relationship among CD4 count, symptoms experience and depression in people living with HIV/AIDS (PLHIV). *International Journal of Science & Healthcare Research.* 2023; 8(2): 23-29.
DOI: *https://doi.org/10.52403/ijshr.20230203*

******