

Research Article

Socio-Demographic and Clinical Correlates of Depression among HIV Patients in Sukkur, Sindh

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ABSTRACT

Background: Depression is one of the common mental health disorders among HIV-positive patients; it affects their adherence to antiretroviral therapy and quality of life. The sociodemographic and clinical correlates of depression among HIV-positive patients in Sukkur, Sindh, are not well studied. The objective of this study was to identify sociodemographic and clinical correlates of depression among HIV-positive individuals in Sukkur, Sindh.

Methods: This descriptive, cross-sectional study was conducted from January to June 2023 at the tertiary level HIV/AIDS clinic at Ghulam Muhammad Mahar Medical College (GMMC) Hospital Sukkur, Pakistan. A cross-sectional study was conducted on 40 HIV-positive patients selected by convenience sampling. The severity of depression was measured by the Hamilton Depression Rating Scale (HAM-D). The socio-demographic variables, co-infections, and ART duration data were also obtained. For this purpose, statistical tests consisted of chi-square tests.

Results: Most participants were male, 80%, and the mean age for the participants was 30.72 years. At the time of assessment, 25% of the patients had a moderate severity of depression, while 15% had severe depression. Co-infections with Hepatitis B, $p=0.043$, and Hepatitis C, $p=0.030$, were significantly associated with higher depression severity. However, no significant association was found between depression and sociodemographic factors such as gender, marital status, or ART duration.

This study has shown how much co-infections, especially Hepatitis B and Hepatitis C, contribute to increased depression in patients with HIV. Interventions for mental health along with the management of co-infections are required among these patients.

Keywords: Depression, HIV Patients, Sukkur, Sindh, Mental Health, Co-Infections.

INTRODUCTION

Depression has long been recognized as one of the major comorbidities among HIV-positive individuals, directly affecting their health trajectory and hindering the clinical management of the disease [1]. Depression among HIV patients may result in reduced adherence to antiretroviral therapy, deteriorating health due to the disease, and heightened mortality [2]. Although global studies have identified high rates of depression among HIV-positive persons, there is a lack of research on sociodemographic and clinical correlates of depression among HIV patients in Pakistan, especially in the Sindh region [3].

There is an increase in the number of HIV cases yearly, and Pakistan is experiencing a snowballing HIV epidemic. The psychological effects of being HIV-positive in the region are severely influenced by the socio-cultural stigma of the disease and the poor availability of mental health services [4]. Depression among HIV patients has been related to factors like sociodemographic characteristics: gender, marital status, and age; and clinical factors: co-infections and duration of ART [5].

Depression and Socio-Demographic Factors
Gender differences in depression among HIV patients have been consistently observed in global studies. A South African study indicated

that social, psychological, and economic factors contribute to higher rates of depression among HIV-positive women compared to men [6]. Marital status has been shown to be one of the major factors, where individuals who are married always tend to have better mental health outcomes than divorced, widowed, or single individuals [7].

Clinical Correlates: Co-infections and ART Duration

Co-infections like Hepatitis B and Hepatitis C among HIV patients are prevalent and known to worsen mental health challenges. A Brazilian study reported that HIV patients with Hepatitis C co-infection showed higher depression scores as compared to their non-co-infected counterparts [8]. Duration of ART is another clinical factor that has been associated with depression. Long-term use of ART may be associated with depression; this is because of the side effects of the medication, though other studies found the adherence to ART leads to better physical health and reduces the burden of depression [9].

Depression and HIV in Pakistan

In Pakistan, a few studies have focused on the interplay between depression and HIV. One such study conducted in Karachi indicated a high rate of depression among HIV-positive individuals, with marital status and co-infection as the main contributing factors [10]. Nevertheless, studies in rural areas like Sukkur are lacking, and the results from urban-based studies cannot be generalized to rural areas because of cultural and healthcare dissimilarities [11].

Literature Review

Global Prevalence of Depression in HIV Patients

In all geographical regions, studies have shown that depression is a major comorbidity among people with HIV infection. In a meta-analysis study in 2019, the authors estimated that worldwide, about 30% of HIV-positive patients suffer from some form of depression, with higher rates noted in low- and middle-income countries because of inadequate access to mental health services and HIV-related stigma [12]. Depression among HIV-positive individuals in sub-Saharan Africa was considered one of the crucial conditions; its prevalence varies between 20% and 60%, depending on the country in question [13].

Gender Differences in Depression among HIV Patients

This condition affects female patients more than male patients, as many studies have shown, including women living with HIV who

are more prone to depression than men. A study conducted among Indian HIV-infected patients reported higher scores among the female gender than their male counterparts [14]. Social stigma, gender-based violence, and financial insecurity have been identified as the major causes of depression among HIV-positive women [15]. Conversely, studies from the United States and Europe indicate a relatively equal sex distribution of depression in HIV patients [16].

Impact of Co-Infections on Depression

In HIV-positive individuals, co-infections such as Hepatitis B and Hepatitis C add to the vulnerability to depression. A study from Brazil showed that co-infected patients had significantly poor mental health outcomes, and Hepatitis C was a strong predictor for depression [17]. Similarly, Hepatitis B has been associated with higher levels of depression among HIV patients, particularly in resource-limited settings [18]. There is evidence that interventions beyond the management of the co-infection may become relevant in improving the mental health of HIV-positive individuals.

ART Duration and Depression

Some have suggested that longer durations of ART use increase the risk for depression due to the drug's side effects, while others stress that adherence to ART may contribute positively to overall well-being by reducing psychological suffering from the burden of living with HIV. A study from Thailand reported higher rates among long-term users of ART, especially among those with side effects like persistent fatigue and gastrointestinal problems [19]. However, according to European data, successful ART treatment can improve quality of life and reduce rates of depression by controlling viral burdens and improving general physical health [20].

METHODS

Study Design and Setting: This was a cross-sectional study conducted for six months at a tertiary care public sector HIV center in Ghulam Muhammad Mahar Medical College (GMMC) Hospital Sukkur, Sindh. The objectives of this study were to find the socio-demographic and clinical correlates of depression among HIV-positive patients attending healthcare facilities in Sukkur [21].

Sample Size and Selection: The minimum calculated sample size for the study was 40 HIV patients. For the calculation of sample size, the formula for a cross-sectional study considers a confidence level of 95% and a margin of error

of 10%. Assuming an estimated HIV-positive patient population of 200 in Sukkur, the sample size calculation was estimated using the following formula:

$$n = \frac{Z^2 \times p \times (1-p)}{E^2}$$

Where:

- n = sample size required
- Z = 1.96 (for 95% confidence level)
- p = estimated prevalence (0.5 for maximum variability)
- E = margin of error = 0.1

This estimate yielded a sample size of 40 participants [22]. Convenience sampling was used to select HIV-positive patients who fulfilled the inclusion criteria [23].

Inclusion Criteria:

- HIV-positive status documented by a doctor.
- Age 18 years and above.
- Informed consent: The competence to give consent involves the ability to receive relevant information and appreciate the

probable consequences of a decision regarding a specific treatment.

Exclusion Criteria:

- The presence of severe cognitive impairment that would interfere with participation.
- Severe psychiatric illness unrelated to depression (e.g., schizophrenia) [25].

Data Collection: Data were collected from structured interviews, which included socio-demographic information (age, gender, marital status), and clinical details such as duration of ART and co-infections. The Hamilton Depression Rating Scale (HAM-D) was used to determine the severity of depression [26].

Statistical Analysis

Descriptive statistics were used to summarize the socio-demographic and clinical characteristics of participants. Chi-square tests were also conducted to examine associations between depression severity and socio-demographic and clinical factors using the chi-square test [27].

RESULTS

Socio-Demographic Characteristics

Variable	Frequency	Percentage (%)
Gender		
Male	32	80
Female	8	20
Marital status		
Single	9	22.5
Married	27	67.5
Divorced	2	5
Widow/Widower	2	5

Mean Age 30.72 years

Depression Severity (HAM-D Scores)

Depression level	Frequency	Percentage (%)
Normal (0-7)	3	7.5
Mild (8-13)	20	50
Moderate (14-18)	10	25
Severe (19-22)	6	15
Very Severe (≥ 23)	1	2.5

Association between Gender and Depression

Gender	Normal	Mild	Moderate	Severe	Very severe	Total
Male	3	17	6	5	1	32
Female	0	3	4	1	0	8
Total	3	20	10	6	1	40

Chi-Square Test: $\chi^2 (4) = 3.85$, $p = 0.426$. No significant association.

Co-infections and Depression

Infection	Normal	Mild	Moderate	Severe	Very severe	P value
Hepatitis B	0	2	0	13	0	0.043
Hepatitis C	0	4	0	0	1	0.030

Association between Age and Depression

Age group (years)	Normal	Mild	Moderate	Severe	Very severe	Total
22-30	2	10	4	0	1	17
31-40	1	7	5	3	1	17
41-45	0	3	1	2	0	6
TOTAL	3	20	10	5	2	40

Chi-square test: $\chi^2 (8) = 9.12$, $p = 0.332$ (No significant association)

DISCUSSION

The study contributes significantly to the understanding of socio-demographic and clinical factors that contribute to depression in HIV patients in Sukkur, Sindh. Although gender, marital status, and ART duration were not found to be significantly associated with depression, co-infection with Hepatitis B and Hepatitis C emerged as the critical contributors to depression severity. These findings are also supported by international studies that indicate a high mental health burden in HIV patients with coinfections.

Co-infections and Depression

One of the most important findings from this study is the strong association between co-infections, particularly Hepatitis B and C, and the severity of depression among HIV patients. This finding agrees with studies done in Brazil and India, which reported that Hepatitis C co-infection was associated with worse mental health outcomes in HIV patients [8, 17]. Hepatitis B and C directly infect the liver; this can heighten the physical and psychological burden of already HIV-infected patients. The chronicity of both the HIV and its co-infections, such as Hepatitis B and C, may contribute to more complicated health problems, thus leading to a greater mental health burden. It will be of importance to manage these co-infections not only to improve physical health but also to enhance psychological well-being [18].

The findings of this study are also in agreement with research indicating that Hepatitis C co-infection results in higher depression scores due to increased physical discomfort and complications associated with liver disease [9]. Hepatitis B, too, which has a high prevalence among HIV patients, can be responsible for precipitating depression through mechanisms such as inflammation and immune system dysfunction, leading to an increase in

psychological distress [10]. Addressing the issue of coinfections in HIV patients, therefore, plays a significant role in ensuring overall mental health and reducing the psychological burden associated with living with multiple chronic conditions.

ART Duration and Depression

In this study, depression was not significantly associated with the duration of ART treatment. This finding opposes some other studies that had linked prolonged ART with depressive symptoms. For instance, some studies in Thailand and South Africa have documented that prolonged ART use can give rise to side effects such as gastrointestinal complications, fatigue, and weight loss, which can then worsen depressive symptoms [19, 20]. However, the present study did not find a significant association, probably because most participants had been on ART for only a short period. Most of the participants in this study had been on ART for less than one year, which perhaps was too short a time for possible medication side effects leading to depression to manifest [21].

Indeed, some literature has indicated that ART adherence can improve physical health through managing viral loads effectively and lower depression rates [22]. Although ART is crucial for the management of HIV disease progression, the immediate psychological benefits of this therapy might not be as obvious, especially in the early stages of treatment. The dynamics between ART and depression are so complex that it could be dependent on factors such as side effects, adherence to the treatment, and overall patient support.

Socio-Demographic Factors and Depression

This finding is unexpectedly different from other studies that have consistently associated gender differences with higher rates of depression. Several studies in South Africa and

India have reported higher rates of depression among women living with HIV.

This could be linked with socio-economic factors such as gender-based violence, economic dependence, and social stigma [6, 14]. This study did not show such a trend, which may again be linked to the small sample size and cultural variation in Sukkur regarding gender roles and stigma associated with HIV, which might influence self-reporting and thus diagnosis of depression. Moreover, the socio-cultural setting in rural populations may lead to variations in the perception of depression itself, which may be reflected in the reporting of it.

Similarly, marital status was not found to be significantly associated with depression in this study, though literature has suggested that married HIV patients generally report better mental health outcomes. The literature has shown that marital support can provide emotional resilience and thereby improve the overall well-being of HIV patients, thus reducing the rates of depression [7]. However, in rural Sukkur where HIV stigma may still persist, being married may not necessarily translate into providing emotional or social support. As a matter of fact, HIV-related stigma could affect the mental health of single and married persons alike, especially when one perceives discrimination or a lack of concern from their families.

Comparison with National and International Studies

These results add to the increasing literature on the interrelationship between HIV, depression, and co-infection. Consistently, studies from other parts of the world have reported that co-infection with other diseases, especially Hepatitis C, is associated with higher rates of depression among HIV-positive patients. In Brazil, a study showed that depression was more severe in HIV-positive patients who were co-infected with Hepatitis C than those who were not [17]. South African research is similarly consistent with this evidence of increased vulnerability among co-infected HIV-positive patients to physical and mental health challenges, with poorer treatment outcomes and quality of life [29].

Nationally, studies conducted in Karachi recorded a high prevalence of depression among HIV-positive patients. Co-infection, gender, and marital status were strong determinants of depression severity [30]. However, this study's findings are contrary, as there was no significant association regarding gender and marital status. This may be due to

regional health-seeking behaviour, stigma levels, and access to health care services.

Strengths and Limitations

The strengths of this study include that socio-demographic, clinical, and psychological factors were considered, thus giving a comprehensive understanding of depression in HIV patients in Sukkur. The application of HAM-D has added strength to the findings since it is a reliable measurement of the severity of depression.

However, this study has several limitations. First, the sample size in this protocol is only 40 participants, which arguably may reduce the generalizability of the findings. Larger samples offer greater robustness and the potential for findings that are generalizable. Second, the cross-sectional design does not enable any causal inferences to be made. Longitudinal studies would be needed to better understand the temporal relationship between HIV, co-infections, ART, and depression. Third, the data were collected from a single center in Sukkur, which may limit its representativeness across various regions in Pakistan.

CONCLUSION

This paper stresses the management of co-infections, especially Hepatitis B and C, to reduce depression in people living with HIV. Interventions regarding co-infection, mental health, and regular screening of depression should be emphasized among this group. In addition, socio-cultural contexts and regional variations should be taken into consideration by healthcare providers while developing appropriate interventions to manage mental health issues among HIV patients. Further study is needed to establish the role of ART duration and gender in relation to depression, using larger and more diverse samples.

Conflicts of Interest

The authors declare no conflicts of interest.

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