

Global Prevalence of Depression in HIV / AIDS: A Systematic Review

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Abstract: *It is increasingly recognized that the incidence of some diseases is a serious worldwide public health concern in terms of their prevention, control and treatment. Such problems impose significant negative effects on socioeconomic, cultural and health status of different communities, leading to devastating impacts on mental health status, which doubles the problem for patients and the people around them, and consequently results in irreparable consequences on countries' health systems. HIV/AIDS is a spectrum of conditions that induce disorders in the human body's immune system, creating numerous sociocultural problems in communities, imposing huge costs on health systems and resulting in mental disorders in infected individuals. According to a report released by WHO, 36.9 million individuals were infected with HIV/AIDS across the world by the end of 2017. It has been reported that more than 60% of the population infected with HIV/AIDS live in countries located in sub-Saharan Africa. Despite a report on new cases of infections showing a stable condition in African countries, the number of people with HIV/AIDS has increased in these countries. Many studies have demonstrated that most individuals affected with HIV/AIDS experience higher rates of anxiety, depression and frustration than ordinary people, especially when hospitalized due to HIV/ AIDS complications.*

Keywords: depression, symptoms, global prevalence, HIV

1. Introduction

It is increasingly recognized that the incidence of some diseases is a serious worldwide public health concern in terms of their prevention, control and treatment. Such problems impose significant negative effects on socioeconomic, cultural and health status of different communities, leading to devastating impacts on mental health status, which doubles the problem for patients and the people around them, and consequently results in irreparable consequences on countries' health systems (1). HIV/AIDS is a spectrum of conditions that induce disorders in the human body's immune system, creating numerous sociocultural problems in communities, imposing huge costs on health systems and resulting in mental disorders in infected individuals. According to a report released by WHO, 36.9 million individuals were infected with HIV/AIDS across the world by the end of 2017. It has been reported that more than 60% of the population infected with HIV/AIDS live in countries located in sub-Saharan Africa. Despite a report on new cases of infections showing a stable condition in African countries, the number of people with HIV/AIDS has increased in these countries. Many studies have demonstrated that most individuals affected with HIV/AIDS experience higher rates of anxiety, depression and frustration than ordinary people, especially when hospitalized due to HIV/ AIDS complications (2). Among these disorders, depression has been reported as the second mental disorder in the world, being prevalent among patients with HIV/AIDS, making their life difficult and causing social rejection. Depression can also have several negative impacts on patients' performance, social relationships and parenting, and in some serious cases, results in behaviors such as committing suicide. It can also prolong the HIV/AIDS medical procedure, which often imposes heavy costs on health systems and individuals. In this respect, the findings of the survey by Owora, a 6-year cohort study, revealed that 22%–36% of people living with HIV/ AIDS in the USA suffer from major depression every year. Recent surveys on

depression among patients with HIV/AIDS in developed countries have also suggested that the prevalence rate in the USA was 13.74% in 2018, whereas it was 35.4% in Spain in 2012 and about 22% in Australia in 2003. Moreover, in developing countries such as Mexico, the prevalence rate was 27% in 2017, and 59.9% and 80.6% in Brazil and China, respectively, also in 2017. On the other hand, the prevalence rate was reported to be 6.2% in 2018 and 28.51% in 2017 in underdeveloped countries such as Uganda and Cameroon. Betancur *et al* shed light on the quality of life, depression and anxiety in a population infected with HIV/AIDS in Brazil. The results of this investigation revealed that 59.5% of the population had symptoms of depression and 44.7% had symptoms of moderate to severe anxiety (3). The findings of a study in Nigeria by Egbe *et al* suggested that women with HIV/AIDS had been much more affected with higher rates of depression compared with men. Another study by Elbadawi and Mirghani demonstrated that depression was more prevalent among patients with HIV/AIDS, especially in women with lower levels of education, as well as married and widows, and those who had not used post diagnostic counselling services in Sudan. The distinction between the present study and other similar studies is that most surveys have been carried out on limited variables affecting the prevalence rate of depression in patients with HIV/AIDS, and most importantly no study has been conducted on this issue globally. The present study was the first comprehensive systematic literature review conducted in such a wide scope. Since complications caused by depression in patients living with HIV/AIDS often influence various socioeconomic aspects as well as public health, it is necessary to adopt new policies and have agenda for thoughtful planning in order to maintain the physical and mental well-being of these individuals (4). This needs detailed statistics and reports on the prevalence rates along with effective factors in this domain at a global level. Moreover, in line with the economy of a country, the cost of care for patients in severe stages of depression can be significantly reduced if well planned during the prevention or early stages. Accordingly, the findings of this study could

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help policymakers in dealing with this problem. In any case, it is necessary to determine the exact burden of this disorder after being affected with HIV/AIDS and its prevalence rate at a global level in order to reduce or eliminate its consequences in infected people. Thus, the present study sought to determine the global prevalence rates of depression in patients with HIV/AIDS using a systematic review and meta-analysis (5).

2. Material and Methods

Search in electronic databases

To meet the study objectives, the international electronic databases of Web of Science, PubMed, Scopus, Cochrane Library, Google Scholar and Embase were searched to find relevant articles using medical subject headings (MeSH) and specific keywords. To this end, 'Depression, Depressive Symptom, and Emotional Depression' were searched for depression in MeSH. The keywords 'Human Immunodeficiency Virus, Human Immunodeficiency Viruses, Human T-Cell Lymphotropic Virus Type III, Human T-Cell Leukemia Virus Type III, Lymphadenopathy-Associated Virus, AIDS Virus, AIDS Viruses, and Acquired Immune Deficiency Syndrome Virus' were searched for HIV. This systematic review focused on original articles published in English from 2000 to October 2018. Following the electronic search, a total of 1652 articles were identified. It should be noted that only studies published from 2000 were employed in this review to evaluate the global prevalence rates of depression in patients living with HIV/AIDS in the current century, since HIV/AIDS was on a rising trend during this period.

3. Results and Discussion

Prevalence rate of depression based on continents

Based on the analysis carried out considering continents, as illustrated in online supplementary file 2, the areas are separated from each other on the basis of the colors of the guide chart, so countries with darker colors in each continent suggest higher prevalence rates of depression in patients with HIV/AIDS than the rest of the continents. Moreover, black spots in different sizes represent the number of articles published in each continent. At the bottom of the map, countries from each continent in which prevalence rates of depression are higher in patients with HIV/AIDS are reported. The dark spots display a high prevalence rate. For example, in Asia, countries such as India, China and Vietnam are the ones where the highest number of patients with HIV/AIDS suffering from depression could be found. Based on the results and the size of the black dots on the map, it is implied that the highest prevalence rate of depression in these patients is in South America at 44% (95% CI 35% to 53%) and the lowest is in Europe at 22% (95% CI 17% to 27%) (6).

Prevalence rate of depression based on six WHO regions

The results of this review showed the prevalence rate of depression in patients living with HIV/AIDS in six WHO regions, in which South-East Asia had the highest prevalence rate at 40% (95% CI 30% to 49%) and Africa had the lowest prevalence rate at 24% (95% CI 19% to

29%). No study had been conducted so far in the WHO Regional Office for the

Eastern Mediterranean

Prevalence rate of depression based on other subgroups Among the questionnaires used to evaluate the prevalence rate of depression in patients with HIV/AIDS, Beck Depression Inventory, which was used 35 times in the selected articles and showing a prevalence rate of depression of 34% (95% CI 28% to 41%), was the most commonly used questionnaire. Similarly, the Center for Epidemiologic Studies Depression Scale, which was used 34 times and showing a prevalence rate of 38% (95% CI 30% to 45%), was another questionnaire employed in the selected articles. 'Other' questionnaires (n=13) indicate that they are researcher-made questionnaires and are not related to credible organizations and institutions. The findings suggest that 99 studies out of 118 articles are cross-sectional, 15 articles are of cohort type, 3 articles are case-control and 1 article is prospective. The prevalence rate of depression in cross-sectional studies, which were the most frequent ones, was 32% (95% CI 28% to 36%). Furthermore, the findings demonstrated that 54 articles were of high quality, and 45 and 19 articles were of medium and low quality, respectively (7).

Prevalence rate of depression based on gender

Among the 31 selected articles and analyses conducted on men and women living with HIV/AIDS, the global prevalence rate of depression in infected men was 8% higher than in women. Overall, the results suggest a significant relationship between the prevalence rate of depression among individuals with HIV/AIDS and gender ($p=0.004$).

This study was the first systematic review and meta-analysis in which the global prevalence rate of depression among patients living with HIV/AIDS was examined. The results of this study estimated the prevalence rate of depression in these patients to be 31%. The analysis of the articles in this domain showed that the prevalence rate of depression among patients with HIV/AIDS in most developed countries was lower than the average obtained in recent years in this study. For example, in the articles published in the USA, 13.74% of 1329 individuals living with HIV/AIDS were suffering from depression. Moreover, another study in this country reported a prevalence rate of depression of 11.45% among 1327 infected individuals. In this regard, several studies were conducted in France and Ukraine, in which the prevalence rates of depression were about 28.1% and 26%, respectively. The low prevalence rates of depression in these countries could be attributed to governmental support for these patients, people's social and cultural awareness, as well as advancements in health status. Surveys conducted in developing or underdeveloped countries in recent years have continuously reported statistics higher and lower than the average shown in the present study (8). For example, the prevalence rate of depression in an article published in India was 44.08% among 186 patients suffering from HIV/AIDS, whereas it was 45.5% for 123 patients in Thailand. Some studies conducted in Africa have also shown that the prevalence rate of depression is 28.2% among those diagnosed with HIV/AIDS, while another survey in the same country has reported a prevalence rate of 6.2%. Thus,

the prevalence rate of depression in these countries has not been stable. The findings of the present study suggest a significant relationship between gender and depression ($p=0.004$) and that the prevalence rate of depression appears to be higher in men than in women. Moreover, the findings of another survey conducted in India on 150 patients have shown that the prevalence rate of depression is higher in men than in women, which is in line with the results of the present study. In contrast, the results of an investigation in Africa by Kinyanda *et al* on 902 patients with HIV/AIDS revealed that men are more subjected to depression than women. The findings of the present study also suggest a significant relationship between year and the prevalence rate of depression ($p=0.001$); the prevalence rate of depression in individuals living with HIV/AIDS is on an annual decrease. Similarly, two studies conducted in South Africa in different years have shown prevalence rates of 56.3% and 20% in 2014 and 2016, respectively (9).

The psychosocial effects of depression on disease progress and life expectancy were particularly noticeable among HIV seropositive people with negative psychosocial related life experience in some of the studies. People living with HIV especially women with chronic depressive symptoms were about two times more likely to die from AIDS than those who never experienced depression. Through the investigation of the number of CD4 cells and viral load, variation in HIV disease progression is mostly contributed by psychosocial factors like hopelessness, depressed mood and lack of coping; regardless of the initiation of medication. Psychosocial factors like social support, a coping mechanism, spirituality and good personal behavior have a positive impact on the improvement of the lifestyle of people living with HIV and may delay disease progression to AIDs. Similarly, many studies support the hypothesis that psychosocial factors and depression can affect immune suppression and disease progression in people living with HIV regardless of the occurrence of opportunistic infection. However, to the best of our knowledge, previous reviews did not focus on the social factors and little studies have examined the biological mechanism that is associated with disease progression and depression (10). Nevertheless, the mechanism of different neuroendocrine factors and whether they are mediators of the abovementioned psychosocial factors or not, remains uncertain regarding their influence in the disease progression.

Depression and Neurohormonal Factors

Some reviewed articles have shown that regardless of the antiretroviral medication, an increased level of hormones related to anxiety, stress or depression is mostly a source for CD4 cells decline and viral load increase, which may lead to accelerated disease progression to AIDS and short life expectancy. Among the various findings obtained from these reviews, only one study has shown that hormones such as norepinephrine, cortisol, and catecholamine exacerbate the effect of depression on immune suppression through the influence of CD4 levels and viral load. In contrast, another study has presented that there is no recorded association between cortisol level and some of the disease progression markers like CD4 level. Even though antiretroviral medication adherence reduces the risk of developing depression by people living with HIV some of the treatments

may have an impact on the noradrenergic effect and can cause HIV disease progression, whereas beta-blocker drugs that block adrenergic mechanism may slow down disease progression [16]. In these reviewed papers, the neurohormones were nonmediators to the association between psychosocial variables and HIV disease progression. Nevertheless, some of the results have shown that both psychosocial and neurohormones predict the progression of the disease (11).

Depression and Virologic Factors

The association between depression and high viral load has been reported in many studies. Lack of adherence to antiretroviral therapy, substance abuse and other risky behaviours were mentioned as mediating factors of depression on higher viral loads resulting from poor HIV disease outcomes. Some of the effects of HIV on the immune system are a significant decline of CD4 count, which makes HIV seropositive people susceptible to opportunistic infection. CD4 T lymphocytes count are major cell types infected by HIV. These cells, being the producer of cytokines, play a major role in the immune defence system against opportunistic infection. Higher average symptomatic depression was predictive for faster degradation in CD4 count. The hormones released by the adrenaline gland during depression and anxiety influenced CD4 count, showing the existence of an association between depression and immune suppression. The severity of symptomatic depression is associated with lower CD4 cell count after adjustment for race, sex and ART adherence. Without controlling medication adherence, findings of measurement scales on the experience of depression and stress also significantly predicted a greater decrease in CD4 cells and an increase in viral load over the same period. Recently, however, these studies have shown that effective management of depression can have a possible advantage for the decline of viral load and management of HIV disease progression. (12).

Depression, which is a common psycho-social reaction found in people living with HIV, is a stressful experience and often persistent. As a consequence, depression is the world's most important source of disability. As a consequence, depression is the most common primary cause of disability. To our knowledge, this is the first review examining the effect of depression on disease progression among people living with HIV across different settings. Among the plausible similar descriptions that all these papers had in common in their findings was the significance of depression as a co-morbid disease observed in HIV patients. The studies had also consistently presented that there is a high prevalence of depression among people living with HIV/AIDS, and disproportionately, the number of people affected by both HIV and depression is higher than the general population. Furtherly, unlike the other reviewed findings, the study by Prasithsirikul *et a. l* reported that anxiety and prevalence were low in people who are on antiretroviral treatment for long period of time. The reason could be attributed to the different statistical test used for the analysis of the association between depression and treatment outcomes and not examining the positive effect of counselling on treatment adherence. In addition, almost all the studies analysed also revealed a strong link between

depression and the result of poor adherence to HIV treatment. Yet, none of them has remarked the potential interactions of antidepressants and anti-retroviral treatments and their effects on disease progression of HIV. One of the recent pieces of evidence shows that anti-depressants are a major factor for HIV disease progression and potentially, the interaction between antidepressants and ART may result in dopamine change, which may aggravate the Neuro HIV [13]. Similar findings from two of the reviewed studies carried out in a different geographical setting have shown that depression and other psychological disorders are associated with lower cellular immunity. However, the studies did not highlight whether depression is a predictor or an outcome of disease progression. This might be related to the different methodological limitations of these studies. Hence, their findings require to be interpreted with caution. The effects of depression on disease progress are investigated mostly from four dimensions including psychosocial, neural, hormonal and virologic factors. As stated in the findings of many studies, a broad range of factors related to psychosocial may affect the underlying viral replication including virologic increment and immune system suppression resulting in HIV disease progression [14].

This reflects the findings that found endocrine, neural and psychosocial factors as a predictor of HIV disease progression. However, none of these studies has highlighted the biological and behavioral mediators to the immune mechanism related with the outcome of disease progression. People with HIV who were also depressed were more likely than people who were not depressed to advance toward AIDS. However, the identified papers for review have shown little about whether chronic or symptomatic depression was associated with disease progression to AIDS. Moreover, some studies have stated that symptomatic depression was not significantly associated with the progression of HIV. Some of the reviewed articles have similarly presented that some of the neurohormones are predicting factors for HIV disease progression. They have mainly focused on the traditional neurohormonal models of stress and depression in which they examined only Sympathetic Adrenal Medullary (SAM) and Hypothalamic-Pituitary-Adrenal (HPA) axis, which is associated with the increase of cortisol, epinephrine, and norepinephrine. Currently, it is found that these investigations were inadequate as some of the hormonal responses to stress or depression mechanism are not mentioned in these articles like oxytocin, which has a buffering effect on stress and depression and the immune function of people living with HIV. The screening tools, study design, data collection instruments and the language used for the validated questionnaire, are one of the remarkable discrepancies in these reviewed studies. Similarly, differences in the definition regarding whether chronic or symptomatic depression are a source for the predictors for disease progression are debatable. One of the drawbacks of this study was the limited number of studies meeting the criteria for inclusion in a systematic search (15).

4. Conclusion

The purpose of the present systematic review and meta-analysis was to evaluate the global prevalence rates of depression in patients living with HIV/AIDS. This study is the first one to examine depression from various aspects. Based on the findings of this study,

the prevalence rates of depression among patients in developing and underdeveloped countries appear to be higher than the values reported in developed countries and the average obtained in the present study. This could be a significant issue for policymakers in this area, due to the negative consequences of depression, including the lack of motivation for treatments, lifelong therapeutic processes, social rejection, as well as additional costs imposed on patients and their families. The findings of this study could help improve decision-making process and make the required data available for planning and providing better care services for those in need.

References

- [1] Prevalence of depression in patients with cancer in Iran: a systematic review and meta-analysis. *BMJ Support Palliat Care* 2019; bmjspcare-2018-001724.
- [2] Rogers BG, Lee JS, Bainter SA, et al. A multilevel examination of sleep, depression, and quality of life in people living with HIV/AIDS. *J Health Psychol* 2018; 9: 1359105318765632.
- [3] Alderete-Aguilar C, Cruz-Maycott R, Candela-Iglesias M, et al. Assessment of depression, anxiety, hopelessness and suicidal risk in HIV+ inpatients. *Salud Ment* 2017; 40: 23–8.
- [4] Troncoso FT, Conterno LdeO. Prevalence of neurocognitive disorders and depression in a Brazilian HIV population. *Rev Soc Bras Med Trop* 2015; 48: 390–8.
- [5] Vega-Ramirez H, Rodriguez V, Cruz J, et al. P021: impulsivity and depressive symptoms in people with HIV diagnosed with a common mental disorder from an HIV clinic in Mexico City. *J Int AIDS Soc* 2015; 18 (3 (Suppl 2)): 20.
- [6] Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006; 3: e442.
- [7] Meziou O, Ghali F, Hamdi G, et al. [Depression among patients affected by the human immunodeficiency virus]. *Med Maladies Infect* 2018; 48: 373–4.
- [8] Owora AH. Major depression disorder trajectories and HIV disease progression: results from a 6-year outpatient clinic cohort. *Medicine* 2018; 97: e0252.
- [9] Adams LM, Wilson TE, Merenstein D, et al. Using the center for epidemiologic studies depression scale to assess depression in women with HIV and women at risk for HIV: are somatic items invariant? *Psychol Assess* 2018; 30: 97–105.
- [10] Betancur MN, Lins L, Oliveira IRde, et al. Quality of life, anxiety and depression in patients with HIV/AIDS who present poor adherence to antiretroviral therapy: a cross-sectional study in Salvador, Brazil. *Braz J Infect Dis* 2017; 21: 507–14.

- [11] Rong H, Nianhua X, Jun X, et al. Prevalence of and risk factors for depressive symptoms among people living with HIV/AIDS receiving antiretroviral treatment in Wuhan, China: a short report. *AIDS Care* 2017; 29: 1524–8.
- [12] Chang JL, Tsai AC, Musinguzi N, et al. Depression and suicidal ideation among HIV-infected adults receiving efavirenz versus nevirapine in Uganda. *Ann Intern Med* 2018; 169: 146–55.
- [13] Kanmogne GD, Qiu F, Ntone FE, et al. Depressive symptoms in HIV-infected and seronegative control subjects in Cameroon: effect of age, education and gender. *PLoS One* 2017; 12: e0171956.
- [14] Egbe CO, Dakum PS, Ekong E, et al. Depression, suicidality, and alcohol use disorder among people living with HIV/AIDS in Nigeria. *BMC Public Health* 2017; 17: 542.
- [15] Elbadawi A, Mirghani H. Depression among HIV/AIDS Sudanese patients: a cross-sectional analytic study. *Pan Afr MedJ* 2017; 26.