Depression in people living with HIV and AIDS: A narrative review

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ABSTRACT. Depression has been recognized as one of the most prevalent psychiatric disorders among people living with HIV and AIDS (PLWHA). It is associated with impaired social functioning, decreased quality of life, poor and inadequate adherence to antiretroviral treatment, loss of follow-up, rapid disease progression and increased mortality. **Aim:** Top carry out a narrative review of the literature to synthesize the main explanatory theories of depresion, its specific characteristics in PLWHA as well as the psychological interventions that have proved effective for its treatment. **Method:** A systematic search of articles in English and Spanish published between July 2011 and July 2021 in indexed electronic databases (PubMed and Scopus) using the terms *HIV*, *depression*, *comorbidity*, *etiology*, and *psychological*. The search complied with the Scale for the Assessment of Narrative Review Articles (SANRA) criteria to ensure the quality of the review and address the research questions. **Results:** This review highlights the importance of depression in PLWHA and provides health professionals with information to detect and address it. **Conclusion:** Detection and treatment of depression are essential for improving outcomes in this population. The information synthesized in this review

aims to support health professionals in the early detection and psychological treatment of depression in PLWHA.

Keywords: HIV, AIDS, depression, psychological intervention, narrative review.

DEPRESIÓN EN PERSONAS QUE VIVEN CON VIH Y SIDA: UNA REVISIÓN NARRATIVA

RESUMEN. La depresión ha sido reconocida como uno de los trastornos psiquiátricos más prevalentes entre las personas que viven con VIH y SIDA (PVVS) asociada a un deterioro del funcionamiento social, disminución de la calidad de vida, adherencia pobre e inadecuada al tratamiento antirretroviral, pérdida de seguimiento médico, rápida progresión de la enfermedad y aumento de la mortalidad. **Objetivo:** Se realizó una revisión narrativa de la literatura con el propósito de sintetizar las principales teorías explicativas al respecto, sus características específicas en PVVS así como las intervenciones psicológicas que han mostrado efectividad para su abordaje. **Método:** Se realizó una búsqueda de artículos en bases de datos electrónicas indexadas (PubMed y Scopus) incluyendo los términos HIV, depression, comorbidity, etiology and psychological. Se incluyeron artículos escritos en inglés y español, publicados entre julio de 2011 y julio de 2021 siguiendo los criterios de la Scale for the Assessment of Narrative Review Articles (SANRA) para asegurar la calidad de la revisión además de responder las preguntas de investigación. **Resultados:** A través de este documento es posible resaltar la importancia de la depresión en PVVS, así como proporcionar herramientas de información que permitan a los profesionales de la salud detectarla y abordarla. **Conclusiones:** La detección y el tratamiento de la depresión son esenciales en esta población. Se espera que la información condensada en esta revisión pueda fortalecer el trabajo diario del profesional de la salud en cuanto a la detección y tratamiento psicológico de la depresión en PVVS.

Palabras clave: VIH, sida, depresión, intervención psicológica, revisión narrativa.

INTRODUCTION

People living with HIV and AIDS (PLWHA) face complex and varied stressful situations, which lead to highly prevalent mental health problems (Amal & Pandin, 2021). These challenges range from the impact of receiving an HIV diagnosis, often in a psychosocial context marked by stigma and discrimination, to the ongoing need for self-care behaviors, including adherence to lifelong treatment to control the infection (World Health Organization [WHO], 2021b). Such difficulties can result in significant mood disorders (Ma et al., 2023; Yang et al., 2024). The extent and severitude of these negative psychosocial repercussions may lead PLWHA to present, at some point, depressive disorders (Rezaei et al., 2019).

Depression is one of the most prevalent psychiatric disorders among PLWHA (Mohammed et al., 2015). Evidence indicates that PLWHA are at a higher risk of developing depressive disorders compared to the general population (Van Coppenhagen & Duvenage, 2019; Yang et al., 2024). Establishing the global prevalence of depression in PLWHA is challenging due to socio-cultural differences among the populations studied, the stage of infection at which the evaluation of symptoms is carried out and the variety of methodologies and tools used. Several studies and systematic reviews report prevalence rates ranging from 30% to 35% (Abebe et al., 2019; Amare et al., 2018; Bernard et al., 2017; Gupta et al., 2013; Kee et al., 2015), other findings suggest rates of around 45% (Bayray, 2013), while some studies describe prevalence as high as 60% to 70% among participants with depressive symptoms (Memiah et al., 2014; Yeneabat et al., 2017). A systematic review that included data from low, middle- and high-income countries found a prevalence rates ranging from 12% to 78% (Uthman et al., 2014). More recently, a systematic review estimated a global prevalence of depression at 31% among PLWHA, noting that developed countries tend to report lower rates compared to developing and underdeveloped countries (Rezaei et al., 2019); for instance, in Mexico, a prevalence rate of 27% was reported in 2017 (Alderete-Aguilar et al., 2017).

The comorbidity between depression and HIV-AIDS triggers significant negative consequences, which have been extensively documented in the literature. These include impaired social functioning, decreased quality of life, poor and inadequate adherence to antiretroviral treatment (ART) —including treatment abandonment—, faster disease progression, and increased mortality rates (Crim et al., 2020; Nanni et al., 2014; Xiao et al., 2020). Detecting and treating major depression and depressive symptoms is essential as the association between these conditions reduced quantity and quality of life in PLWHA is well-established (Arseniou et al., 2014; Yeneabat et al., 2017).

Recognizing the critical role of depression in PLWHA, this narrative review was conducted to address the following questions: What are the general clinical characteristics of depressive disorders? What theories have been proposed regarding the

development of depressive disorders? What is currently known about the comorbidity between depression and HIV? Which psychological variables are associated with the presence of depression in PLWHA? And what psychological interventions have proven effective in addressing depression in this population?

METHOD

The strategy used to obtain relevant literature involved searching indexed electronic databases (PubMed and Scopus) for the following terms: *HIV*, *depression*, *comorbidity*, *etiology*, *risk factors*, and *psychological interventions*. The same terms were used in both databases. We selected articles written in English, published between July 2011 to July 2021. Observational studies, narrative and systematic reviews, and high-quality experimental studies were included.

The selection of articles was peer-reviewed, with at least two authors assessing the appropriateness of each study. Articles were excluded if the population of interest included children, adolescents, or individuals without an HIV diagnosis. Additionally, studies that did not provide information relevant to the objective of this review were excluded. See Appendix 1 for the list of articles included in this review.

The search details were as follows: ((HIV[Title] OR AIDS[Title]) OR PLWHA[All Fields]) AND Depression[Title] AND ("2011/07/01"[PDat] : "2021/07/01"[PDat]) and ((HIV[Title] OR AIDS[Title]) OR PLWHA[All Fields]) AND Depression[Title] AND ("psychosocial intervention"[MeSH Terms] OR ("psychosocial"[All Fields] AND "intervention"[All Fields]) OR "psychosocial intervention"[All Fields] OR ("psychological"[All Fields] AND "interventions"[All Fields]) OR "psychological interventions"[All Fields]) AND ("2011/07/01"[PDat] : "2021/07/01"[PDat]).

To ensure the quality of the review, we adhered to the criteria outlined in the Scale for the Assessment of Narrative Review Articles (SANRA) (Baethge et al., 2019). The specific sections of the review are presented below.

RESULTS

Clinical characteristics

Depression is a common mental disorder characterized by sadness, loss of interest or pleasure in activities, feelings of guilt or worthlessness, disrupted sleep or appetite, fatigue, and difficulty concentrating (World Health Organization, 2021a). When these symptoms persist and substantially interfere with an individual's daily life, impairing their ability to function in important areas, such as work and social relationships, the condition can be classified as a disorder (American Psychiatric Association, 2014).

Major depression is the most prevalent mental health disorder among PLWHA and poses significant challenges for its diagnosis. The biological, psychological, and social factors associated with HIV infection can blur the distinction between the symptoms of HIV and those of depression, leading to potential misdiagnosis or undetected cases (Arseniou et al., 2014).

In a recent systematic review aimed at providing a global overview of depressive disorders in PLWHA (Medeiros et al., 2020), the following relevant aspects were highlighted:

a) the criteria established for mental disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) should be used to diagnose depressive disorders in PLWHA;

b) the most common symptoms of major depressive disorder in PLWHA are anhedonia and mood variations during the day.The use of psychometric instruments that exclude somatic symptoms when assessing PLWHA is recommended, particularly in cases where symptoms are associated with HIV infection or advanced stages of the disease

Other important factors to consider when evaluating depressive symptoms include a history of previous depressive episodes, the stage of infection, substance use or abuse, age, perception of HIV-related stigma, and availability of support networks (Nachega et al., 2012).

Regarding the stigma associated with HIV, particularly internalized stigma, its presence has been shown to increase vulnerability by promoting the development of mental health problems, primarily exhibited as depressive symptoms. These can, in turn, lead to poor adherence to ART (Sweeney & Vanable, 2016). Research has indicated that cognitive depressive symptoms are more strongly associated with stigma than somatic symptoms (Wagner et al., 2011). Based on these findings, stigma should be considered a prominent intervening variable and a significant source of depressed mood in PLWHA.

Focusing on cognitive symptoms, specific manifestations such as general loss of interest, decreased concentration, feelings of worthlessness, and recurrent thoughts of death have been identified as particularly concerning. These symptoms can adversely affect the self-management of self-care behaviors and activities essential for successful HIV treatment (Gonzalez et al., 2011).

An important aspect of depression is its role as a risk factor for suicide, particularly given its high prevalence among individuals living with HIV (Jia et al., 2012). Current evidence indicates that suicide rates among PLWHA are eight to ten times higher than those observed in the general population. According to a cohort study examining causes of death among PLWHA, suicide is the 7th leading cause of death not directly attributable

to HIV, and globally, 2 % of deaths among PLWHA are attributed to suicide (Croxford et al., 2017). Based on the above, it is essential to identify the presence and lethality of suicidal ideation, as well as the associated intentions and planning.

In summary, cognitive depressive symptoms should be prioritized by mental health professional to avoid confusion with physical symptoms, which are more likely associated with HIV-AIDS or opportunistic infections. Another reason cognitive symptoms are particularly relevant is their close association with significant factors such as stigma and discrimination (Wagner et al., 2011).

Etiopathogenesis

Depression is a multifactorial phenomenon, and several theories address its etiology in PLWHA (Arseniou et al., 2014). Some theories state that depression is primarily determined by biological factors. These may include alterations in white matter structure, hypothalamic-pituitary-thyroid dysfunction, or depressive behavior induced by certain proteins (Langford et al., 2011).

Other studies suggest that viral action may predispose PLWHA to develop depression. Prolonged activation of infected immune system cells releases inflammatory cytokines, leading to chronic "sickness state behavior" or reduced tryptophan bioavailability, which affects serotonergic neurotransmission. These models are supported by studies demonstrating that ART has a protective effect against depression by reducing immune cell activation and cytokine levels (Nanni et al., 2014).

Other theories emphasize psychosocial factors, including the stigma associated with the disease (Duko et al., 2018; Logie et al., 2013), which has historically been linked to groups at higher risk of acquiring HIV, such as men who have sex with men and injecting drug users (Chambers et al., 2015). Another psychosocial determinant is work disability caused by HIV/AIDS symptoms and changes in body image, which particularly affected PLWHA who were taking the first generation of ART. The isolation, hopelessness, and lack of social support that often follow an HIV diagnosis can also contribute to the development of depressive symptoms in PLWHA (Duko et al., 2018; Schuster et al., 2012).

Other theories consider the history and comorbidity of multiple psychiatric illnesses. Having two or more lifetime psychiatric disorders, along with a history of major depressive disorder, increases the risk of a depressive disorder episode by up to five times (Atkinson et al., 2008). Additionally, individuals at higher risk of acquiring HIV, such as those with substance use disorder —particularly injecting drug users— are also at greater risk of developing depression (Schuster et al., 2012). This is particularly relevant considering that depression has been regarded as both a potential cause and a consequence of psychological stress and other mental disorders (Kinser & Lyon, 2014).

Finally, depression in PLWHA may be associated with the administration of ART. For example, the combination of dolutegravir and rilpivirine appears to increase the risk of depressive symptoms. Similarly, efavirenz has been associated with neuropsychiatric symptoms, including a higher risk of depression, as well as suicidal ideation and suicide attempts (Kenedi & Goforth, 2011; Mollan et al., 2014). Although the literature remains controversial (Chang et al., 2018), the type of treatment should be carefully considered to ensure closer monitoring of patients receiving ART. If possible, their use as a first-line treatments should be avoioded in patients with depressive disorders or risk factors for depression.

Depression in PLWHA

Numerous studies have identified variables that increase the risk of depressive symptoms in PLWHA. The following sections describe the clinical, socio-demographic, and psychological factors associated with depressive symptoms, as well as the consequences of this condition in PLWHA.

Regarding clinical variables, individuals with a recent diagnosis (Kee et al., 2015) or negative emotions related to the diagnosis (Slot et al., 2015) are more likely to experience depressive symptoms, possibly due to difficulty adjusting to the diagnosis. Additionally, being in advanced clinical stages or experiencing opportunistic infections has also been associated with depression (Bernard et al., 2017; Duko et al., 2018; Yeneabat et al., 2017). Experiencing adverse effects of ART also seems to increase the likelihood of depressive symptoms in PLWHA (Gebrezgabher et al., 2017).

In terms of socio-demographic variables, factos such as being female, younger age (Abebe et al., 2019), living alone, low socio-economic status, low income, food insecurity, or unemployment have been associated with an increased risk of depression in PLWHA (Amare et al., 2018; Bernard et al., 2017; Duko et al., 2018).

With respect to gender differences, women living with HIV appear to be at greater risk of developing depressive symptoms than men, and that their symptoms tend to be more intense, possibly due to their greater vulnerability (Bernard et al., 2017). However, some studies have reported an opposite relationship. Specific circumstances related to depression have been observed in both groups. In women, low education and income appear to be predictors of depression, whereas in men, being single, experiencing anticipated stigma, or living in rural areas are more strongly associated with depression (Gupta et al., 2013). When considering age, some studies suggest that older adults are at greater risk of developing depressive symptoms due to grief and loss commonly associated with this stage of life (Javadi et al., 2017; Taylor, 2014).

Psychological variables may also serve as risk factors. For example, a history of psychiatric illness, substance use or abuse, dissatisfaction with sexual life or relationships

(Slot et al., 2015), lower social support, and HIV-related stigma have been identified in multivariate studies as predictors of depression (Bernard et al., 2017; Duko et al., 2018). As previously mentioned, living with HIV and the stigma and discrimination it entails, whether experienced or anticipated, increase the overall risk of mental health problems (Mohammed et al., 2015; Mohite et al., 2015). Additionally, hopelessness caused by illness and lack of coping strategies are associated with depression in PLWHA, leading to poor clinical outcomes and disease progression (Schuster et al., 2012; Yousuf et al., 2019).

Detecting and treating major depression and depressive symptoms is crucial, as the relationship between these conditions and reduced quality of life in PLWHA is well established (Arseniou et al., 2014; Yeneabat et al., 2017). Depressive symptoms have also been linked to increased risk behaviors (Kemigisha et al., 2019; Mohammed et al., 2015) a higher likelihood of comorbidities such as substance use (Gaynes et al., 2015), and reduced life expectancy (Yousuf et al., 2019).

Depression has also been associated with poorer adherence to ART, even in multivariate analyses that account for other clinical and socio-demographic variables (Memiah et al., 2014; Wroe et al., 2015; Yousuf et al., 2019). Individuals with depressive symptoms are up to 42 % less likely to adhere properly to ART (Uthman et al., 2014). Moreover, depression is associated with decreased antiretroviral persistence, defined as a shorter time between treatment initiation and discontinuation (Springer et al., 2012).

Depression may also contribute to disease progression (Schuster et al., 2012; Rivera-Rivera et al., 2016). It has been associated with lower T-CD4 lymphocyte counts (Arseniou et al., 2014; Ironson et al., 2015), higher viral load levels, and an increased risk of clinical illness and mortality (Arseniou et al., 2014; Duko et al., 2018; Prasithsirikul et al., 2017). Women with chronic depressive symptoms are up to twice as likely to die of AIDS-related causes compared to those without depressive symptoms (Cook et al., 2008).

Despite the negative impact of depression on PLWHA, a significant percentage of individuals with this mental health condition remain undiagnosed and untreated. Moreover, the efficacy of psychotropic medications in PLWHA remains insufficiently studied, Therefore, further research is needed on early detection and implementation of evidence-based interventions to address depression in PLWHA (Pence et al., 2012).

Evidence-based psychological interventions

Psychological treatment plays a key role in the management of depressive disorders in PLWHA (Sin & DiMatteo, 2014) and has several advantages over pharmacotherapy (Winter & Barber, 2013), including flexibility, limited side effects, and relatively low cost (Linden & Schermuly-Haupt, 2014). Psychological treatment, combined with community

interventions and self-care strategies, has been recommended for addressing depressive symptoms in people living with HIV (Fuenmayor & Cournos, 2022).

The use of various interventions to manage depressive symptoms is common, given the diversity of psychotherapeutic approaches, which stems from the education and training of clinical psychologists (Carrasco, 2017). However, when working with PLWHA, it is crucial to implement evidence-based psychological interventions to ensure that effective strategies are provided for addressing depression in this population (Martinez, 2014).

Systematic reviews and meta-analyses of studies conducted in high- (Spies et al., 2013; Wu & Li, 2013), middle- and low-income countries (Asrat et al., 2020; Sikkema et al., 2015) indicate that a variety of psychological treatments are successful in reducing depressive symptoms in PLWHA. Interventions, including problem-solving therapy, skills training, and stress management strategies, have shown positive results in managing mental health problems, supporting the use of cognitive-behavioral treatments as a key mental health intervention approach for PLWHA (Sherr et al., 2011; Sikkema et al., 2015). Interventions combining psychological therapies with medication were generally more effective than those using either psychological therapies or medication alone (Sikkema et al., 2015).

The most recent meta-analysis evaluating psychological interventions for depressive symptoms among PLWHA in low- and middle-income countries (Asrat et al., 2020), reports that the psychological treatments used included cognitive behavioral therapy, psychoeducation, peer counseling, interpersonal therapy, and problem-solving therapy. In terms of the effects of the interventions, analysis by type of psychological treatment showed larger effect sizes for interpersonal therapy (standard mean difference=–1.72, 95 % CI: –3.21, –0.23) and problem-solving therapy (standard mean difference=–1.14, 95 % CI: –3.63, 1.35), and small effect sizes for cognitive behavioral therapy (standard mean difference= –0.03, 95 % CI: –0.27, 0.21). However, there was significant heterogeneity among the types of psychological treatments and among the characteristics of the participants included in the studies, which limits the conclusions that can be drawn from these comparisons. The small effect size for cognitive behavioral therapy may be related to factors beyond the therapy's inherent effectiveness; for example, the experience and skills of the therapist, as well as the cultural acceptability of the intervention (Asrat et al., 2020).

It has been found that when this type of therapy is delivered by non-psychologist health workers, it is often not effective, as it requires specific training in skills and techniques (Peltzer et al., 2012). The clinical trials evaluated in the meta-analysis by Asrat et al. (2020) showed that studies where cognitive behavioral therapy was delivered by non-psychologist counselors were less effective (Jalali et al., 2019); than those that evaluated interpersonal therapy delivered by non-psychologist counselors (Mathiga, 2015; Petersen et al., 2014). Several studies indicate that the increase in the number of trained

and supervised non-psychologist counselors implementing psychological interventions is due to the lack of human resources in low-income settings (Javadi et al., 2017; Munodawafa et al., 2017; Opiyo et al., 2016). Moreover, the implementation of interventions by non-psychologist counselors has been identified as feasible and acceptable (Matsuzaka et al., 2017; Mendenhall et al., 2014), provided they receive the necessary supervision.

Another important factor may be the number of active ingredients in the intervention, as it is known that effective interventions for the treatment of mental disorders in PLWHA should include three or more active ingredients. Those associated with effectiveness include: cognitive restructuring, positive coping skills, personal problem-sharing strategies, social support, and behavioral activation (Nakimuli-Mpungu et al., 2021). In terms of the format of interventions, no significant differences have been found between group and individual interventions (Asrat et al., 2020; Sherr et al., 2011), suggesting that either approach could be implemented. However, it is critical to consider issues of confidentiality, cost, and acceptability when choosing a format (Chibanda et al., 2014).

Although women with HIV have been studied much less than men, they appear to respond well to different types of psychological interventions. In the review by Sikkema and colleagues (Sikkema et al., 2015), five studies that included exclusively or mostly women as participants found psychological interventions to be effective. This was not the case in the studies that included PLWHA with depressive symptoms and substance use; only two of these five studies reported that the psychological intervention was effective. The same review found that most studies (63.6%) conducted with gay or bisexual men had an effective intervention, while only half of the studies with a mixed sample (gender, sexual orientation) had an effective intervention.

These results highlight the importance of considering gender, sexual orientation, and the presence of other mental health issues when implementing psychological interventions for depressive symptoms, as these are factors that may attenuate their effectiveness.

Additionally, while interventions for PLWHA should be based on scientific evidence, unique issues affecting this population should not be overlooked. These include potential barriers related to HIV-associated stigma (Yehia et al., 2015), comorbidities such as substance abuse (Gonzalez et al., 2011; Kader et al., 2012), and other prevalent disorders among PLWHA, like anxiety disorders (Machtinger et al., 2012), as well as lack of integration of mental health services in HIV care facilities, particularly in rural areas (Parcesepe et al., 2018).

In conclusion, depression in HIV is a well-documented issue with significant consequences for health outcomes, particularly for the virological control of infection (Rezaei et al., 2019; Xiao et al., 2020). Therefore, systematic and regular assessment is essential

to enable timely intervention. Evidence shows that effective interventions are available and should be incorporated into standard care for PLWHA (Asrat et al., 2020; Sikkema et al., 2015; Spies et al., 2013; Wu & Li, 2013). However, there is still variable and inconclusive evidence regarding which type of psychological treatment is most effective.

The main limitations of studies on effective interventions for depressive symptoms in PLWHA include the following: the multiple definitions of depression used, and the various ways of measuring the phenomenon. For example, there is a difference between scoring above a cut-off point on a mood inventory and having a clinical diagnosis of depression. It would be useful to establish some consistency in measurement and internationally agreed-upon indices for comparison across studies. While the available information regarding sample types provides valuable insight into specific groups, it remains difficult to assess to what extent this information can be generalized to women, adolescents, and developing countries (Sikkema et al., 2015). Additionally, studies with robust research designs are needed to test factors such as the duration of interventions, and the feasibility, effectiveness, and sustainability of the treatment effect over time (Asrat et al., 2020; Sherr et al., 2011; Sikkema et al., 2015).

CONCLUSION

This manuscript aims to provide a clear and useful overview of depression in PLWHA, allowing healthcare professionals to identify the prevalence and causes of depression in this population, which are related to lower social support, HIV-related stigma, illness-related hopelessness, and lack of coping strategies, among others (Schuster et al., 2012; Yehia et al., 2015). In this context, it is crucial to recognize the negative impact that depression has on essential self-care behaviors for managing the disease, including adherence to ART and medical follow-up, as well as increased likelihood of engaging in risky behaviors (Yousuf et al., 2019). Consequently, stressors should be identified and addressed early, given the potential consequences of depression in people living with HIV, such as accelerated disease progression and higher mortality. This process should consider cultural factors and utilize valid and reliable assessment tools (Simoni et al., 2011). Furthermore, it is important to assess other relevant psychological variables associated with depression in PLWHA, such as stigma, substance use, anxiety, and social support (Armoon et al., 2022).

Additionally, certain profiles of people living with HIV are at higher risk for developing depressive disorders, including those with a recent diagnosis, those in advanced clinical stages of the disease, women, individuals with low income, and those facing discrimination (Bernard et al., 2017; Kee et al., 2015). Recognizing these characteristics is valuable for timely identification of individuals who need more specific and preventive support to effectively manage their disease (Arseniou et al., 2014).

In conclusion, the evidence demonstrates that effective interventions are available and can be integrated into the care of PLWHA, although the evidence remains variable and inconclusive regarding which specific intervention is most effective. Interpersonal and problem-solving interventions seem to have the greatest impact (Asrat et al., 2020). Further research is needed to assess the effectiveness of psychological interventions for depression in people living with HIV, especially their applicability in online, distance, or group formats, which could provide promising strategies to reach a larger number of people and achieve a greater impact (Ebert et al., 2018). It is hoped that the information presented in this review will help strengthen the daily efforts of healthcare professionals in detecting and treating depression in PLWHA.

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APPENDIX 1

Table 1.

Articles included in this study

Topic	Authors (year)	Type of study	Aim of study
Clinical characteristics	Arseniou et al., (2014)	Narrative review	To review the recent research related to depression in HIV-infected patients and discuss both methodological limitations and future directions of research on this topic, as well as to formulate useful recommendations concerning diagnosis and management of major depression in these patients.
	Croxford et al., (2017)	Observational cohort	To describe mortality and causes of death in people diagnosed with HIV in the HAART era compared with the general population.
	Gonzalez et al., (2011)	Systematic review and meta-analysis	To meta-analyze the relationship between depression and HIV medication nonadherence to calculate the overall effect size and examine potential moderators.
	Jia at al., (2012).	Nationwide register study	To explore socioeconomic and psychiatric characteristics of persons with AIDS or HIV infection and to assess the effect of AIDS/HIV infection on risk for subsequent suicide in the context of psychiatric comorbidity and socioeconomic status.
	Medeiros et al,. (2020)	Narrative review	This review summarizes clinically useful information on depressive disorders in HIV/AIDS. More specifically, it addresses assessment, differential diagnosis, contributing factors, management, and common challenges in the treatment of depressive disorders in seropositive individuals.
	Nachega et al., (2012)	Cross-sectional study	A global assessment of perceptions of HIV-related stigma among PLWHA.
	Sweeney et al., (2016)	Systematic review and synthesis of the literature	A focused synthesis and critique of the quantitative literature on HIV-related stigma and HIV medication adherence.
	Wagner et al,. (2011)	Cross-sectional and longitudinal study	To examine how depression severity, symptom type, and change over time relate to adherence.

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Topic	Authors (year)	Type of study	Aim of study
Etiopathogenesis	Winter & Barber (2013)	Review and synthesis of the literature	Overview of the most commonly recommended treatments for depression is provided, along with a brief review of the evidence supporting their efficacy.
	Chambers et al., (2015)	Qualitative synthesis of literatur	To synthesize qualitative evidence that explored the intersections of stigma and health for people with HIV.
	Kenedi & Goforth (2011)	Systematic review	To examine the current data regarding the neuropsychiatric effects of efavirenz, and also attempts to provide guidance to clinicians using efavirenz to treat patients with mental illness.
	Kinser & Lyon (2014)	Review and synthesis of the literature	To describe a conceptual framework about the complex and bidirectional relationship between stress vulnerability, depression, and health outcomes in women.
	Langford et al,. (2011)	Retrospective review of clinical data	To provide compelling evidence for potential HIV-mediated alterations in hypothalamic signaling in the HPT feedback loop that may result in abnormal thyroid hormone levels.
	Logie et al., (2013)	Multi-method community-based research study	To contribute to understanding about the associations between the independent variables (racial discrimination, gender discrimination, HIVrelated stigma), moderator/mediators (resilient coping, social support), and dependent variable (depression) among HIVpositive ACB women in Ontario, Canada.
	Mollan et al,. (2014)	Clinical trial	To compare time to suicidality with efavirenz-containing versus efavirenz-free antiretroviral regimens for initial treatment of HIV.
	Nanni et al., (2014)	Review and synthesis of the literature	To provide a comprehensive understanding of the available literature focused on depression and HIV infection and some insight on questions of prevalence and connections.
	Schuster et al., (2012)	Review and synthesis of the literature	To suggest a theoretical model of pathways of HIV progression, with a focus on the contributions of depression —as well as secondary, behavioral and emotional variables.

(*continues*)

(*continued*)

Topic	Authors (year)	Type of study	Aim of study
Depression in PLWHA	Abebe et al., (2019)	Cross-sectional	To assess the prevalence and associated factors of depressive symptoms among youth living with HIV attending antiretroviral terapy (ART) follow-up at public hospitals Addis Ababa, Ethiopia, 2016
	Amare et al., (2018)	Systematic review and meta-analysis	To summarize the most current available evidence from 2010 to March 2017 among adult PLWHIV in Ethiopia.
	Bernard et al., (2017)	Systematic review and meta-analysis	To summarize the available evidence on the prevalence of depression and associated factors according to the scales used and the treatment status in PLHIV in SSA
	Cook et al., (2008)	Multicenter prospective cohort	To explore the relationships between crack use and HIV-1 disease outcomes in a multicenter cohort of infected women.
	Duko et al., (2018)	Cross-sectional	To assess prevalence and factors associated with depressive symptom among people living with HIV/AIDS attending Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia.
	Gebrezgabher et al., (2017)	Case–control	To identify determinants of non-adherence to ART among HIV-infected adults in Aksum town health facilities, northern Ethiopia.
	Gupta et al., (2013)	Observational comparative	To evaluate the differences in psychopathology and suicidal risk in HIV positive male subjects
	Ironson et al., (2015)	Prospective	To examine the prospective relationships between the stress hormones cortisol and especially NE (since there is much less literature about NE and good in vitro evidence of its importance in HIV) and HIV disease progression.
	Javadi et al., (2017)	Systematic review	To review the available evidence to determine whether a systems approach is employed in the implementation and evaluation of task shifting for mental health using lay providers in low- and middle-income countries, and to highlight system-wide effects of task-shifting strategies to inform better efforts to strengthen community mental health systems.

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Topic	Authors (year)	Type of study	Aim of study
Depression in PLWHA	Kee et al., (2015)	Observational cohort	To determine the level of and factors associated with anxiety and depression among HIV-infected patients for improving their quality of life.
	Kemigisha et al., (2019)	Cross-sectional survey	To determine the prevalence of depressive symptoms and their associated factors among ALHIV in Uganda
	Memiah et al., (2014)	Multinational, multicenter, retrospective cross-sectional	To assess the relationship between depressive symptoms, CD4 count, and adherence to antiretroviral therapy (ART) in 4 countries in sub-Saharan Africa (Nigeria, Uganda, Zambia, and Tanzania).
	Mohite et al., (2015)	Cross-sectional	To assess the level of perceived stigma and depression among women with HIV/AIDS infection and to determine the relationship between perceived stigma and depression.
	Pence et al., (2012)	Literature review	To contribute to the understanding of the detection, prevalence, diagnosis and treatment of depression in HIV care.
	Prasithsirikul et al., (2017)	Cross-sectional	To assess the prevalence and factors associated with anxiety and depression in HIV-infected patients from the Thai National HIV Treatment Program
	Rivera-Rivera et al., (2016)	Literature review	To discuss the literature pertaining to the effects of HIV-related psychiatric comorbidities, particularly depression, over the adherence to ART regimen, inflammation, prognostic outcomes, and subsequent HIV-disease progression. In addition, we review psychosocial and neurobiological factors that influence the manifestation of depression and depressive-like behaviors in this population.
	Slot et al., (2015)	Cross-sectional	To determine the prevalence of depression and describe the psychiatric history of HIV-infected individuals in an out-patient clinic in Denmark and to identify factors of clinical importance that may be used to identify patients at risk of depression.

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	Authors (year)	Type of study	Aim of study
Evidence-based psychological interventions	Taylor (2014)	Clinical Review	A case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.
	Uthman et al., (2014)	Systematic review and meta-analysis	To investigate the associations between depressive symptoms and adherence to antiretroviral therapy (ART) among people living with HIV (PLHIV).
	Wroe et al., (2015)	Cross-sectional	To determine the prevalence of depression in HIV-infected adults on antiretroviral therapy in rural Rwanda and measure the association of depression with non-adherence.
	Yeneabat et al., (2017)	Cross-sectional	To identify the prevalence of depressive symptoms and associated factors among PLHIV attending the antiretroviral therapy clinic at Fitche Zonal Hospital.
	Yousuf et al., (2019)	Literature review	To provide an insight into the effect of depression on disease progression among people living with HIV.
	Asrat et al. (2020)	Systematic review and meta-analysis	To identify effective psychological treatments to manage depressive symptoms for adult PLWHA in LMICs and to estimate pooled effect sizes using a meta-analysis.
	Carrasco (2017)	Literature review	To identify common aspects and particular elements of intervention for an integrative, flexible and personalized clinical approach for patients with depression.
	Chibanda et al., (2014)	Randomized controlled trial	To determine the efficacy of group problem-solving therapy (PST) delivered by peer counselors versus pharmacotherapy for PND in a cohort of postpartum HIV-infected and uninfected women attending primary care postnatal clinics in urban Zimbabwe.
	Fuenmayor & Cournos (2022)	Literature review	To do a review on the detection, differential diagnosis, and treatment of depressive disorders among adults in HIV primary care settings in the United States.

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	Authors (year)	Type of study	Aim of study
Evidence-based psychological interventions	Jalali et al., (2019)	Randomized Controlled Trial	To determine the efficacy of cognitive group therapy based on schema-focused approach in reducing depression in prisoners living with HIV.
	Javadi et al., (2017)	Systematic review	To review the available evidence to determine whether a systems approach is employed in the implementation and evaluation of task shifting for mental health using lay providers in low- and middle-income countries, and to highlight system-wide effects of task-shifting strategies in order to better inform efforts to strength community mental health systems.
	Kader et al., (2012)	Observational and correlational	To evaluate whether the use of validated questionnaires (AUDIT and DUDIT) provide useful and consistent information of alcohol and drug consumption when compared with the use of biomarkers of alcohol in (urine and hair) and drugs in (urine) and assessing the feasibility of using self-report measures compared with urine and hair tests.
	Linden & Schermuly-Haupt(2014)	Literature review	To demonstrate and discuss the existence of side effects derived from psychotherapy.
	Machtinger et al., (2012)	Systematic review and meta-analysis	To estimate rates of psychological trauma and posttraumatic stress disorder (PTSD) in HIV-positive women from the United States.
	Martinez (2014)	Literature review	To present the core characteristics of evidence-based psychological practices.
	Mathiga (2015)	Experimental, clinical trial with control group	To test the effectiveness of Interpersonal Therapy on depression and suicidality among people living with HIV/AIDS attending City Council Health facilities in Dagoretti district.
	Matsuzaka et al., (2017)	Randomized controlled trial	To examine a new model for depression care in a low-resource environment compared to enhanced treatment at usual (E-TAU).
	Mendenhall et al., (2014)	Multi-site qualitative	To examine stakeholder perceptions of the acceptability and feasibility of task-sharing across five settings that plan to roll out district level mental health care plans using task-sharing in primary care.

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	Authors (year)	Type of study	Aim of study
Evidence-based psychological interventions	Munodawafa et al., (2017)	Post intervention qualitative semi-structured interviews	To explorie the perceptions of counselors who delivered a task shared psycho-social counseling intervention for perinatal depression in Khayelitsha, Cape Town together with independent fidelity ratings.
	Nakimuli-Mpungu et al., (2021)	Systematic review	To synthesize the literature on mental health interventions for PLWH in low- and middle-income countries (LMICs) to determine intervention components and explore their relationship with intervention effectiveness.
	Opiyo et al., (2016)	Case study	To examine the efficacy of nonspecialists delivering interpersonal psychotherapy (IPT) to HIV-positive (HIV+) women
	Parcesepe et al., (2018)	Cross-sectional	to describe the reported availability of screening and treatment of depression, anxiety and PTSD in HIV treatment sites globally and assess trends in the reported availability of screening and treatment of depression and PTSD over time at HIV sites in LMICs.
	Peltzer et al., (2012)	Randomized controlled trial	To examine whether a lay health worker lead structured group intervention is effective in improving adherence to ART when combined with standard adherence intervention strategies in a cohort of HIV-infected adults.
	Petersen et al., (2014)	Randomized controlled trial	To assess the feasibility of a group-based counseling intervention for depressed HIV-positive patients in primary health care (PHC) in South Africa using a task shifting approach.
	Rezaei et al., (2019)	Systematic review and meta-analysis	To clarify the global prevalence rate of depression in patients living with HIV/AIDS via a systematic review and meta-analysis.
	Sherr et al., (2011)	Systematic review	To provide a comprehensive understanding of evaluated interventions related to HIV and depression and provide some insight on questions of prevalence and measurement.

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	Authors (year)	Type of study	Aim of study
Evidence-based psychological interventions	Sikkema et al., (2015)	Systematic review	To synthesize findings from mental health intervention trials with PLWH in LMICs to inform the delivery of mental health services in these settings.
	Sin & DiMatteo (2014)	Systematic review and meta-analysis	To examine whether treatment of depression and psychological distress improves antiretroviral therapy adherence.
	Spies et al., (2013)	Literature review	To review the existing literature on the use of CBI for depression and anxiety in HIV-positive adults and to assess the effect size of these interventions.
	Winter & Barber (2013)	Literature review	To present and an overview of the most commonly recommended treatments for depression is provided, along with a brief review of the evidence supporting their efficacy.
	Wu & Li (2013)	Literature review	To perform a review on evaluations of community-based interventions aimed at improving psychosocial well-being of PLWHA.
	Xiao et al., (2020)	Systematic review and meta-analysis	To examine the prevalence of depression in MSM living with HIV and conduct a comprehensive meta-analysis of the epidemiology of depression in this population.
	Yehia et al., (2015)	Qualitative with semi-structured interviews	To investigate and compare the experiences of patients who are retained and not retained in care to better understand the differences between these groups, including both the number and type of barriers and facilitators to retention in care they report.