Living positive with HIV in Botswana: a self-help intervention for people living with HIV and depressive symptoms

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Chapter 1

General Introduction

1. HIV and HIV prevalence

Human Immunodeficiency Virus (HIV) is a significant global public health challenge affecting an estimated 39.9 million people worldwide by the end of 2023 (World Health Organization, 2024). In Africa, the prevalence of HIV has remained high and the majority (67%) of people living with HIV (PLWH) globally, are found in sub-Saharan Africa (Moyo et al., 2023). Botswana's HIV prevalence also remains high (Mine et al., 2024), placing the country as one of the most affected by the epidemic.

"HIV reclaims title of Botswana's biggest killer": an unsettling headline that appeared on a local newspaper (Sunday Standard newspaper dated May 12th, 2025). This is, however, not an exaggerated newspaper article, as the annual report by Statistics Botswana (2025) indicates that by 2023 HIV remains the leading cause of mortality in Botswana. This is a reminder that despite decades of national progress in HIV treatment and care, the HIV epidemic remains a burden in Botswana (Simela, Kelepile, & Sebobi, 2025). National estimates based on the fifth Botswana AIDS Impact survey (BAIS V) conducted in 2021 indicate that approximately 20.8% of adults in Botswana aged 15–64 years are living with HIV, corresponding to more than 329,000 adults (Government of Botswana, 2023). The BAIS V reported that the prevalence of HIV is higher among women (26.2%) compared to men (15.2%) (Government of Botswana, 2023), raising questions regarding gender-based factors that may contribute to increased vulnerability among women.

During a public address, the Acting Deputy Coordinator of the National AIDS and Health Promotion Agency (NAHPA), delivered an unsettling observation: *"A handful of men are spreading the virus to many women in Botswana."* His statement tells the complex dynamics that continue to fuel the spread of the epidemic and highlights factors such as gender inequality and gaps in HIV prevention. It has been argued that women in Botswana are more vulnerable to HIV infection due to socio- economic factors, gendered ideologies and cultural practices (Ellece, 2016). According to a report by the World Bank (2025), despite educational progress, women in Botswana continue to face economic and social inequalities including lower rates of employment which limits their access to finances. Mostly women in Botswana do informal work which increases their vulnerability to poverty and health risks, including HIV (World Bank, 2025).

In response to the HIV crises, Botswana has positioned HIV prevention and treatment as a national health priority (NAHPA, 2020). Antiretroviral therapy (ART) is provided free of charge in public facilities, and the country has surpassed the UNAIDS 95-95-95 targets: over 95% of PLWH know their status, nearly all of those diagnosed are on ART, and the vast majority achieve viral suppression (Government of Botswana, 2023). Botswana is also the first country in the world to achieve the World Health Organization's "gold tier" status for the elimination of mother-to-child transmission of HIV (WHO, 2025). These achievements reflect investment in health systems, and community engagement.

Living with HIV today has been transformed by ART (Daniel, Semvua, Anna, Bonaventura, & Elichilia, 2017; Jima, Angamo, & Wabe, 2013). The treatment suppresses viral replication, leading to a reduced amount of the virus in the blood (viral load) (UNAIDS, 2016). With consistent adherence, viral load can be reduced to undetectable levels, preserving immune function, preventing opportunistic

infections, enabling near-normal life expectancy and reducing the transmission of HIV (UNAIDS, 2016). This highlights both the individual and public health benefits of ART adherence. However, there are concerns about the future of HIV treatment; financial aid is under pressure, and it is expected that globally less ART will be available, especially in Africa (e.g., due to the termination of a significant component of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) funding) (Tram, Ratevosian, & Beyrer, 2025). Additionally, there are reported disruptions in the supply of ART, and many HIV facilities have closed due to funding cuts, preventing individuals living with HIV from accessing life-saving treatment (Magura, Nhari, & Nzimakwe, 2025). This may lead to a rise in new infections and the numbers of PLWH (Tram, Ratevosian, & Beyrer, 2025) undermining efforts towards HIV care and treatment so far.

2. Depressive symptoms among PLWH

Living with HIV extends beyond medical care. PLWH often contend with stigma, discrimination, and psychosocial stressors that impact mental health and overall well-being (Setlhare, Wright & Couper, 2015). Depressive symptoms (including depressive disorders) are particularly common among PLWH, with global estimates suggesting that up to one-third of PLWH experience depressive symptoms (Rezaei et al., 2019). In sub-Saharan Africa, the prevalence of depressive symptoms among PLWH is also high. Recent systematic reviews and meta-analyses estimated the prevalence of depressive symptoms among PLWH in Africa to be 36% (Molapo, Mokgalaboni, & Phoswa, 2025) and 33.32% (Tadesse et al., 2025). Another earlier meta-analysis reviewing journal articles published between 2000 and 2018 found the prevalence of depressive symptoms among PLHIV to be 36.5% (Bigna et al., 2019). These statistics match global estimates indicating that at least a third of PLWH in Africa struggle with depressive symptoms.

Studies in Botswana showed that between 24% and 48% of PLWH experience depressive symptoms (Brooks et al., 2023; Lawler et al., 2011; Lewis, Mosepele, Seloilwe, & Lawler, 2012; Vavani et al., 2020), placing the prevalence of depressive symptoms as high as the global prevalence. Depressive symptoms in PLWH are associated with multiple negative outcomes. Some examples include a decline in health and functioning (GBD Mental Disorders Collaborators, 2022); delay in achieving HIV viral suppression (Huang et al., 2025); more frequent hospital visits (Boulanger, Zhao, Bao, & Russell, 2009), poor medication adherence (Zhou et al., 2022) and increased mortality (Abas, Ali, Nakimuli-Mpungu, Chibanda, 2014). These negative outcomes may potentially result in increased new infections. These negative outcomes also underscore the need for a comprehensive approach to HIV care that integrates mental health care alongside medical treatment. As it seems, it is increasingly evident that the world must be concerned with addressing the full burden of HIV, going beyond the physical and also addressing the psychological challenges faced by PLWH.

2.1 Interventions for depressive symptoms among PLWH

Despite the severe impact, depressive symptoms among PLWH often remain underdiagnosed and undertreated, particularly in resource-limited settings where mental health services are scarce or inaccessible (Maphisa, 2019; Qambayot & Naidoo, 2023). Additionally, accessibility of mental health services in low-and-middle-income countries (LMICs) is hampered by mental health-related stigma and

poor mental health literacy (Grimes et al., 2024). In Botswana, low mental health literacy and stigma seem to negatively affect access to mental health services (Monteiro, 2014). Human resources are also limited with psychiatrist-to-population ratios being low. For instance, compared to the global average of 3.96 psychiatrists per 100,000 people in high-income countries, there are 0.04 to 0.30 psychiatrists per 100,000 people in LMICs (Rathod et al., 2017). These professionals are mostly based in urban areas and may not be accessible to those in rural areas, creating a treatment gap which is exacerbated by other factors such as poverty, conflict, social inequalities, limited budget for mental health, limited infrastructure, and low self-worth (Rathod et al., 2017).

Botswana, like many developing countries, faces a critical shortage of mental health professionals (Maphisa, 2019), and the few professionals are often clustered in urban centers (Madigele, Moeti & Moeti, 2024). Nonetheless, Botswana has made strides in addressing mental health issues in general, such as through the development of mental health policies and the establishment of psychology departments in some hospitals to offer face to face counselling and other psychological services (Sidandi, Opondo, & Tidimane, 2011). There is also the Mental Health Act of 2023 (Government of Botswana, 2023) which guides the care, treatment and services for persons with mental health conditions in Botswana. Despite these efforts, there is still far too little capacity to provide mental health care to every patient (Maphisa, 2019).

Traditional models of mental health treatment, such as relying on specialized clinical services, face numerous barriers in low- and middle-income countries (LMICs) where the majority of PLWH reside (Galea, Marhefka, Cyrus, Contreras, & Brown, 2020). There is a need for mental health interventions that are scalable, cost-effective, and easy to implement in primary care or community settings. For instance, Botswana's HIV clinics already operate with well-established workflows, regular ART refill appointments, viral load checks, and adherence counseling sessions (Ministry of Health, 2023). Embedding a brief mental health screening into these processes could be a low-cost, high-impact intervention, especially if followed by simple referral or psychosocial support options. However, once depression is identified, what happens next?

Self-help interventions, particularly those based on Cognitive Behavioral Therapy (CBT), have emerged as promising tools for managing depressive symptoms in various populations, including PLWH (Arjadi, Nauta, Chowdhary, & Bockting, 2015; Bockting, Williams, Carswell, & Grech, 2016; Matcham et al., 2014; Naslund et al., 2017). CBT is an evidence-based psychological approach that helps individuals identify and change unhelpful thought patterns and behaviors that contribute to depressive symptoms (Gautam, Tripathi, Deshmukh, & Gaur, 2020). Its structured, time-limited, and skills-based nature makes it particularly suited for adaptation into self-help formats (Gaudiano, 2008). While CBT-based self-help interventions have demonstrated effectiveness in high-income settings (e.g., Kraaij et al., 2010; van Luenen, Kraaij, Spinhoven, & Garnefski, 2016; Andersson, Titov, Dear, Rozental & Carlbring, 2019; Cuijpers, Noma, Karyotaki, Cipriani & Furukawa, 2019), their adaptation and implementation in LMICs need more exploration as there are many barriers to intervention design and delivery (Verhey, Ryan, Scherer, & Magidson, 2020). Furthermore, understanding the contextual factors that influence the

acceptability, feasibility, and sustainability of these interventions is crucial for successful adaptation and implementation (Verhey, Ryan, Scherer, & Magidson, 2020).

Self-help programs are efficient in alleviating symptoms of depression (Matcham et al., 2014), and have the advantage of being cost-effective, can help many people at the same time, at their own place and time, without stigma (Bower, Richards, & Lovell, 2001). Moreover, self-help interventions involve less staff time (Wright et al., 2005), can be computer-adapted (Arjadi, Nauta, Chowdhary & Bockting, 2015), and are suggested to be more suitable in settings short of professional and highly qualified healthcare workers (Bockting, Williams, Carswell & Grech, 2016; Kraaij et al., 2010; van Luenen et al., 2016). There remains a significant treatment gap in Botswana, as evidence-based interventions for managing depressive symptoms among PLWH have yet to be fully developed and integrated into existing healthcare services.

3. This Doctoral Dissertation

This doctoral dissertation addresses this gap by systematically reviewing literature on self-help interventions for mental health issues among people in low-and-middle income countries, and by developing, testing, and evaluating a CBT-based booklet self-help intervention tailored for PLWH experiencing depressive symptoms in Botswana. The dissertation contributes to advancing mental health care for PLWH in Botswana by providing evidence for practical, scalable solutions for mental health issues. The scalability and low cost of self-help CBT interventions make it a good option for reaching large populations in resource-constrained environments (Bockting, Williams, Carswell & Grech, 2016). Moreover, self-help approaches may reduce stigma by offering privacy and convenience, encouraging greater uptake and adherence (Edwin, Cornwall, & Du Plooy, 2024). Additionally, this research investigates the contextual and systemic challenges to the implementation of the CBT-based self-help intervention in low-resource settings. Such an approach enables a comprehensive understanding of how to optimize intervention delivery and maximize public health impact.

3.1 Project Objectives

The overarching aim of this doctoral research was to advance the understanding and development of scalable, effective self-help interventions for depressive symptoms among people living with HIV (PLWH), with particular emphasis on LMICs settings.

The first objective of the dissertation was to contribute to the broader body of evidence on mental health interventions in LMICs by conducting a meta-analysis of existing self-help interventions for depressive symptoms among individuals in LMICs. The meta-analysis investigated the effectiveness of both guided and unguided self-help interventions delivered in different formats (e.g., booklet, digital, etc.) and focused on the treatment of depressive symptoms and also investigated sociodemographic and clinical variables that might account for the differential effect of interventions on depressive symptoms. The meta-analysis positioned the intervention in the context of initiatives aimed at mitigating depression in LMICs and helped highlight gaps and opportunities for future research and practice.

The second objective of the dissertation was to explore correlates and risk factors for depressive symptoms among PLWH, in order to find intervention targets for depressive symptoms among PLWH in

Botswana. We also explored the mental health needs for PLWH in Botswana and conducted a feasibility assessment for a self-help intervention. The identification of specific intervention targets strengthened the evidence base and provided relevance of self-help treatment approaches and also supported the development of tailored and culturally appropriate strategies to address depressive symptoms.

Thirdly, we aimed to develop a CBT-based self-help intervention to reduce depressive symptoms among PLWH in Botswana. This phase of the dissertation was focused on the adaptation of an existing intervention and presenting the intervention and the randomized controlled trial (RCT) protocol.

The fourth objective was to empirically evaluate the effectiveness of the CBT-based self-help intervention through an RCT and to report on the effectiveness of this intervention in treating depressive symptoms among PLWH in Botswana. The effect of the intervention was examined in the short and long term. We also examined the effect of the intervention on symptoms of anxiety and determined user satisfaction with the intervention. Evaluating a self-help intervention's efficacy through a rigorous RCT provides strong evidence to support scale-up efforts and helps bridge the gap between theory and application.

Lastly, the dissertation aimed to examine implementation challenges and facilitators as well as to present an evidence-based implementation strategy for the newly developed self-help intervention to treat depressive symptoms in PLWH in Botswana. The implementation research identified practical ways to overcome real-world obstacles when adapting and implementing the intervention.

Achieving the objectives of this PhD dissertation is critical for bridging the gap between mental health needs and the availability of accessible, evidence-based services for PLWH in Botswana. The PhD project addresses a major public health challenge by focusing on depressive symptoms, one of the most prevalent yet under-recognized comorbidities among PLWH. By improving understanding and response to depressive symptoms, this study contributes directly to national efforts to enhance HIV care outcomes and overall quality of life.

The findings of this research hold significant promise for improving mental health outcomes in Botswana and other LMICs where HIV and mental health burden is the greatest. Accessible interventions that improve depressive symptoms can contribute directly to improved HIV related health outcomes including viral suppression and reduced morbidity. Together, these objectives support this comprehensive research project aimed at making meaningful improvements in the mental health and overall well-being of PLWH in Botswana.

3.2 Outline of the doctoral dissertation

This doctoral dissertation comprises five interrelated peer-reviewed papers that systematically review the literature, and explore the development, evaluation, and implementation of a CBT-based self-help intervention for depressive symptoms among PLWH in Botswana. Below is a summary of each paper.

Chapter 2 contains a meta-analysis on the effectiveness of self-help interventions in the treatment of depressive symptoms in low-and-middle-income countries (LMICs). The meta-analysis investigated the pooled effect of self-help interventions for people with depressive symptoms in LMICs in the short and

long term as well as characteristics that may affect the effectiveness of these psychological interventions.

Chapter 3 investigated the correlates and risk factors associated with depressive symptoms in PLWH. In this chapter, we identified key cognitive and behavioural targets for addressing depressive symptoms in PLWH in Botswana. In addition, we explored the mental health needs of PLWH in Botswana and studied the feasibility of a culturally appropriate self-help intervention to treat depressive symptoms.

Chapter 4 describes the study protocol. The protocol outlines the background of the design of the intervention, participant eligibility criteria, recruitment strategies, intervention content and delivery methods, outcome measures, and planned statistical analyses of the RCT.

Chapter 5 presents the findings from the RCT to evaluate the effectiveness of the adapted CBT-based booklet self-help intervention to reduce depressive symptoms among PLWH in Botswana. Effectiveness was evaluated based on depressive symptom severity and anxiety symptom severity.

Chapter 6 explored the real-world challenges encountered when implementing the CBT-based booklet self-help intervention among PLWH in Botswana. Based on qualitative data from the field and researchers' experiences, this study identifies barriers such as costs, lack of screening for depressive symptoms, among others, and proposes implementation strategies to address these barriers.

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