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# EXPERIENCES OF STIGMA, SOCIAL SUPPORT, AND ANXIETY IN PEOPLE LIVING WITH HIV IN SOUTH CAROLINA

by

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# ABSTRACT

People living with HIV (PLHIV) experience numerous psychosocial stressors, including HIV-related stigma and heightened prevalence of mental health disorders such as depression, substance use disorders, and anxiety. However, limited research has investigated predictors of anxiety within this population. This study aimed to explore the relationship between HIV-related stigma and anxiety symptoms among PLHIV in South Carolina (SC) and to examine the role of social support as a mediator for this relationship. A total of 402 PLHIV receiving HIV care at large immunology center in SC completed a paper and pencil survey, reporting sociodemographic variables, as well as experiences of HIV-related stigma (i.e., enacted, anticipated, and internalized stigmas), social support, and anxiety. A multivariate analysis of variance was conducted to assess differences in reported HIV-related enacted, anticipated, and internalized stigma by gender, sexual identity, and age. An analysis of variance was conducted to assess differences in reported anxiety by gender, sexual identity, and age. A multiple mediation model was conducted to determine whether social support mediated the relationships between the three types of HIV-related stigma (i.e., enacted, anticipated, and internalized) and anxiety. Experiences of HIV-related anticipated and internalized stigma but not enacted stigma differed by participants' gender, sexual identity, and age. Anxiety symptoms were not predicted by gender, sexual identity, or age. The multiple mediation model indicated that while HIV-related enacted and internalized stigma predicted anxiety, anticipated stigma did not predict anxiety. Social support did not mediate the

relationship between enacted and internalized stigma on anxiety. These findings highlight the importance of completing mental health screeners within HIV care clinics. In addition, mental health practitioners should be aware of the specific stressors such as HIV-related stigma experienced by PLHIV. Beyond individual interventions, community-based stigma reduction efforts must be made to improve the mental health outcomes of PLHIV.

TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF ABBREVIATIONS

AIDS… ..... acquired immunodeficiency syndrome

ANOVA ..... analysis of variance

APA..... American Psychiatric Association

ART..... antiretroviral therapy

AZT..... azidothymidine

CBT…..... cognitive behavioral therapy

CDC ..... Central for Disease Control and Prevention

EHE..... Ending the HIV Epidemic

FDA..... U.S. Food and Drug Administration

FIML ..... full information maximum likelihood

GAD-7..... Generalized Anxiety Disorder Scale 7

HIV ..... Human Immunodeficiency Virus

HSD..... honest significant difference

IAPAC..... International Association of Providers of AIDS Care

MANOVA..... multivariate analysis of variance

MOS..... Medical Outcomes Study

MSM ..... men who have sex with men

OIDP ..... Office of Infectious Disease and HIV/AIDS Policy

PLHIV..... people living with HIV

SC..... South Carolina

US ..... United States

# CHAPTER 1: INTRODUCTION

Within the United States (US), approximately 1.1 million people are living with human immunodeficiency virus (HIV) (Center for Disease Control and Prevention [CDC], 2022b). HIV is a virus that weakens the body's immune system by destroying CD4 cells, a type of white blood cell that is critical for fighting off viruses, bacteria, and other infections (CDC, 2022a). Individuals with lower CD4 cell counts, such as people living with HIV (PLHIV) who have a high viral load, are thus vulnerable to diseases and illnesses (CDC, 2021c). When left untreated, HIV progresses into acquired immunodeficiency syndrome (AIDS) in which individuals have significantly reduced CD4 cell counts and extremely weakened immune systems; individuals with AIDS are highly susceptible to 'opportunistic infections' because their body is no longer able to harness a normal immune response (CDC, 2021a). The number of AIDS-related death and opportunistic infections in the US has decreased due to advances in HIV treatment. Indeed, while deaths amongst those diagnosed with HIV in the US in 2010 per 100,000 was 6.3, this was reduced to 5.7 deaths per 100,000 in 2019 (CDC 2013, 2021b). In 2020, the rate of deaths amongst those diagnosed with HIV in the US increased to 6.6 per 100,000 (CDC, 2022b). However, these numbers should be interpreted with caution as it is difficult to disentangle the effect of the COVID-19 pandemic from the HIV epidemic (CDC, 2022b).

Medical advances have played a key role in the reduction of AIDS-related deaths and opportunistic infections in the US. The US Food and Drug Administration (FDA) approved azidothymidine (AZT), the first HIV treatment in 1987 (HIV.gov, 2022b). Despite its initial promise, AZT was ultimately found to be highly toxic and ineffective at controlling HIV (Chiu & Duesberg, 1995). After this, combinations of numerous therapy regimes were used for treatment but were largely unsuccessful. However, in 1996, a combination of multiple drugs in one pill was approved by the FDA, marking an important change in the progression of HIV treatments (HIV.gov, 2022b). Large clinical studies found that this combination of three medications was effective in slowing disease progression (Hammer et al., 1997). This marked an important transition in HIV outcomes, shifting HIV from a deadly disease to a chronic health condition when treated properly. Indeed, in 1997, AIDS-related deaths declined by 47% compared with 1996, demonstrating the promise of this medication (HIV.gov, 2022b). These outcomes have continued to improve.

Although there is currently no effective cure for HIV, antiretroviral therapy (ART), a combination of HIV medications typically combined into a once-a-day pill, enables PLHIV to live longer, healthier lives when it is taken consistently (CDC, 2021a). ART reduces the viral load or amount of HIV in someone's blood (HIV.gov, 2022a). In addition, ART prevents the reduction in CD4 count, thus reducing the likelihood of opportunistic infections (CDC, 2021c).

Regular adherence to ART can reduce the viral load to the point someone is virally suppressed or has reached 'undetectable' viral loads (<200 copies of HIV per ml of blood) (Eisinger et al., 2019). Although the virus is still present, these low levels of

viral load prevent the transmission of HIV through sex (Bavinton et al., 2018; Rodger et al., 2016, 2019). Therefore, HIV treatment can also be a means of HIV prevention. Given the importance of this finding for treatment and prevention of HIV, it has been widely advertised through the "U = U" or "Undetectable = Untransmittable" campaign (Eisinger et al., 2019). Regular adherence to ART is thus a crucial aspect to improving the lives of PLHIV as well as for preventing HIV.

Medical advances have also improved prevention efforts. In 2012, the FDA approved the use of pre-exposure prophylaxis, (PrEP), a once-a-day pill to prevent HIV in high-risk individuals (FDA, 2012). When taken regularly, PrEP reduces the chance of acquiring HIV through sex by 99% and through injection drug use by 74% (CDC, 2022b).

Given these medical advances, it is crucially important to engage PLHIV in care in order to achieve and maintain viral suppression. The steps to doing so are termed the 'HIV care continuum' and include awareness of HIV status, linkage to care, retention in care, adherence to ART, and viral suppression (Kay et al., 2016). The federal Ending the HIV Epidemic (EHE) plan seeks to reduce new HIV infections in the US by 90% by 2030 through early diagnosis, rapid treatment, and quick responses to potential outbreaks (Office of Infectious Disease and HIV/AIDS Policy [OIDP], 2020a).

Despite these strong treatment and prevention efforts, new diagnoses and poor HIV care outcomes persist. There are several key populations that are disproportionately affected by HIV, making them of particular interest in HIV prevention and treatment. Gay, bisexual and other men who have sex with men (MSM) accounted for the majority (69%) of new diagnoses in 2019 (CDC, 2021b). In addition, young individuals make up a

large portion of new diagnoses, with those ages 13-24 years accounting for 21% of new diagnoses in 2019 (CDC, 2021b). Black and African American individuals likewise have a heightened rate of new HIV diagnoses, with a rate of 37.3 per 100,000 compared with 16.7 in Hispanic/Latino populations, 12.6 for Multiracial populations and 4.6 in White populations (CDC, 2021b).

Regional disparities also exist in HIV care outcomes. For example, the US South holds a disproportionate burden of new HIV diagnoses, with a rate of 15.2 new diagnoses per 100,000 in 2019 compared with 9.4 in the Northeast, 9.2 in the West, and 7.0 in the Midwest (CDC, 2021b). For this reason, the EHE plan targets several key jurisdictions with a high prevalence of new HIV diagnoses including certain states and counties across the US (HIV.gov, 2020). The priority states are primarily located in the US South, including the state of South Carolina (SC) (OIDP, 2020b).

The Fast-Track Cities initiative is a global partnership among cities who commit to improve HIV outcomes by reducing the number of new HIV infections and the number of AIDS-related deaths to zero (International Association of Providers of AIDS Care [IAPAC], 2022). The Paris Declaration on Fast-Track Cities was first signed in 2014 by 27 cities, with a commitment to attaining '90-90-90' goals, namely that 90% of people living with HIV would know their status, 90% of those diagnoses with HIV would be on antiretroviral therapy (ART) and that 90% of those on ART would be adherent (IAPAC, 2022). As of August 2022, over 300 cities and municipalities including Columbia, the capital of SC, have signed the Paris Declaration on Fast Track Cities, which now aims for 95-95-95 goals (IAPAC, 2022; Paris Declaration, 2021).

In addition to its goals related to medical outcomes, the Fast-Track Cities initiative also seeks to improve the quality of life of PLHIV. PLHIV face numerous psychosocial stressors such as experiences of stigma and discrimination, as well as challenges with managing their HIV care. For this reason, the Fast-Track Cities initiative also seeks to reduce HIV-related stigma to zero (Paris Declaration, 2021). In addition, they note that integrating mental health, sexual and reproductive health, and HIV-related services is critical for healthcare (Paris Declaration, 2021).

Beyond the Fast-Track Cities initiative, recent calls have been made for the integration of mental health services along with HIV care (Remien et al., 2021). This is important because mental health disorders have implications for the management of HIV care, for adherence to ART, and for achieving a high quality of life. Indeed, a recent meta-analysis of 45 studies published between 2002-2017 found that mental health diagnoses were associated with a decreased odds of retention in HIV care (Rooks-Peck et al., 2018). However, mental health service utilization was associated with increased odds of retention in HIV care, highlighting the importance of engaging PLHIV in mental health services (Rooks-Peck et al., 2018).

Despite the importance of mental health treatment, mental health disorders are relatively understudied in PLHIV. A 2017 review identified a relative scarcity of research examining anxiety amongst PLHIV compared with other mental disorders such as depression (Brandt et al., 2017). The extent literature, though limited, suggests that while anxiety may not be associated with disease progression as measured by CD4 count, it may be implicated in decreased ART adherence (Brandt et al., 2017). Beyond this, anxiety has been found to be related to worsened quality of life among PLHIV (Brandt et

al., 2017). For this reason, it is critical to understand the mechanisms behind anxiety in PLHIV to support mental health services for this population.

**Anxiety**

Anxiety can be described as the anticipation of, or worrying about, a future threat (American Psychiatric Association [APA], 2022). Fear, in contrast, is the emotional response to a real or perceived threat and is often associated with a fight or flight response (APA, 2022). Anxiety and fear both occur within the general population, with everyone experiencing situations which are anxiety and/or fear provoking (APA, 2022). However, some individuals experience persistent, heightened, and excessive anxiety, which is characteristic of an anxiety disorder. Anxiety disorders are marked by excessive anxiety that causes clinically significant distress or impairment in daily functioning (APA, 2022). Common anxiety disorders include panic disorder, generalized anxiety disorder, agoraphobia, specific phobias, social anxiety disorder, post-traumatic stress disorder, obsessive compulsive disorder, and separation anxiety disorder (APA, 2022). Anxiety disorders are the most commonly experienced mental disorder in the US. Indeed, approximately 2 in 5 (41.7%) U.S. adults will experience an anxiety disorder within their lifetime (Kessler et al., 2012). In a given year, 22.2% of adults in the U.S. experience an anxiety disorder (Kessler et al., 2012).

Generalized anxiety disorder is one of the commonly experienced anxiety disorders, with a 12-month prevalence rate of 2.9% in adults residing in the US (APA, 2022). Across the lifetime, approximately 9% of US adults will experience generalized anxiety disorder (APA, 2022). It is marked by excessive anxiety or worry that is difficult to control, occurs more days than not for at least 6 months, and causes significant

impairment or distress (APA, 2022). The disorder is associated with feeling restless, being easily fatigued, having difficulty concentrating, irritability, muscle tension, and changes in sleep (APA, 2022). Although the symptoms of generalized anxiety disorder are similar to symptoms associated with other anxiety disorders, generalized anxiety disorder symptoms occur across settings and activities (APA, 2022). In contrast, someone with a specific phobia would experience marked fear or anxiety in the presence of a specific object or situation (e.g., heights) but not across all contexts (APA, 2022). Despite this, there is considerable overlap between anxiety disorders in symptoms and presentations.

Generalized anxiety disorder has heightened prevalence in certain populations. For example, women are more likely to have generalized anxiety disorder than men, representing 55-60% of those presenting with generalized anxiety disorders in clinical settings and two-thirds of those with generalized anxiety disorders in epidemiological studies (APA, 2022). In addition, while people of all ages can experience generalized anxiety disorders, diagnosis peaks around middle age, forming an inverted "u" shape (APA, 2022). In North American, the mean age of onset for generalized anxiety disorder is age 35 years (APA, 2022). Amongst PLHIV, generalized anxiety disorder prevalence estimates have ranged from 15-25% (Beer et al., 2019), demonstrating a higher burden of anxiety within PLHIV compared with the general population. Those at heightened risk for HIV also have higher rates of generalized anxiety disorder compared with the general population. For example, amongst gay and bisexual men, generalized anxiety disorder prevalence has been estimated to be 10% (Meyer, 2003). Given this heightened prevalence of anxiety among PLHIV and key populations at risk for HIV, it is important

to understand the experiences of PLHIV with anxiety to better provide integrated mental health services alongside HIV care.

**'Greying' of HIV**

With regular adherence to ART, PLHIV are able to live long and healthy lives (CDC, 2021c). This contrasts starkly to the early years of the HIV epidemic, when an HIV diagnosis was, in essence, a 'death sentence'. Widespread access to ART has now led to large numbers of people aging with HIV in the US. Indeed, the overall age of PLHIV is increasing, which has been described as the 'greying of the epidemic' (Weinstein et al., 2021). The prevalence of HIV among individuals aged >65 years grew by 48% from 2015 to 2019 in the US (CDC, 2021b). In 2019, the highest prevalence rate of HIV was found in those ages 50-54 (741.1 per 100,000), followed by 55-59 (737.7 per 100,000), and 45-49 years (577.2 per 100,000) (CDC, 2021b). Older PLHIV face unique psychosocial needs compared to younger PLHIV. For example, as a result of living with HIV for extended periods of time, older PLHIV may have experienced high levels of stigma early in the epidemic (Weinstein et al., 2021). Likewise, older PLHIV must navigate the process of aging while simultaneously navigating living with HIV (Weinstein et al., 2021). Despite these indications of unique experiences within the population, the aging population of PLHIV has been under researched (Weinstein et al., 2021). The present research seeks to fill this research gap by examining experiences of PLHIV across age demographics.

**Stigma**

Stigma may be an important contributor to this heightened experience of anxiety among PLHIV compared with the general population. Stigma occurs when an individual

is “reduced in our minds from a whole and usual person to a tainted, discounted one” because of carrying certain attributes that are devalued in a society (Goffman, 1963, p. 3). Applied to PLHIV, stigma occurs when someone is discredited because of their HIV status or reduced solely to being considered a person with HIV rather than a multi-faceted individual. Stigma is embedded in societal power structures, such that those who hold power stigmatize those without power to maintain societal positions (Earnshaw & Chaudoir, 2009). Stigma is not an inherent part of an individual, but rather a social construction such that it is attached to a person by others (Link & Phelan, 2001). Goffman’s original conceptualization examined stigma related to sexual identity specifically (Goffman, 1963). However, the concept of stigma has been further applied to understand a variety of characteristics devalued by society including HIV status.

Link and Phelan (2001) theorized stigma as the co-occurrence of five components: labeling, stereotyping, separation, status loss, and discrimination. Specifically, individual differences such as HIV status are labeled and then in turn associated with negative stereotypes of those attributes (Link & Phelan, 2001). This act of labeling leads to a perceived separation between those who do and do not have that label (Link & Phelan, 2001). For example, those without HIV consider themselves to be substantially different from PLHIV. Those without the stigmatized characteristic (i.e., HIV) engage in discrimination towards those with the stigmatized characteristic to distance themselves from the stigmatized group (Link & Phelan, 2001). Ultimately, this stereotyping and discrimination leads to a status loss for the stigmatized group such that those without the stigmatized attribute continue to hold more power than those with the characteristic (Link & Phelan, 2001).

Stigma occurs for a variety of characteristics, traits, or identities that are devalued by society, including but not limited to HIV status, gender and sexual identities, age, and race. Intersectionality theory posits that the experiences of those with intersecting marginalizing identities are shaped by each of the identities as well as their interaction (Crenshaw, 2017). For example, the experiences of Black women are shaped not only by being Black and by being a woman but also by being a Black woman. Berger has expanded intersectionality theory to the concept of intersectional stigma, recognizing that stigma is attached to a variety of traits that are devalued by society (Berger, 2022). When someone experiences multiple stigmatized identities or traits, their experience is shaped not only by the experience of stigma related to each of those identities but also by intersectional stigma, emerging from the combination of those traits. There are several key populations with a heightened HIV prevalence that also are stigmatized within US society, such as gay, bisexual, and other MSM, transgender men and women, Black and African American individuals, Latinx individuals, and those who use injection drugs (CDC, 2020). Therefore, many PLHIV experience the compounding effects of both HIV-related stigma and other stigmas.

These experiences of stigma can have a long-lasting impact on the health and wellbeing of those who are stigmatized. Hatzenbuehler and colleagues (2013) have proposed that stigma ought to be considered a fundamental cause of population health inequities. Fundamental causes are those determinants of health which affect multiple health outcomes for a substantial number of individuals (Hatzenbuehler et al., 2013). They operate through a variety of mechanisms such as reduced access to resources, including social connections, power, and money (Hatzenbuehler et al., 2013). These

mechanisms not only increase the risk of adverse health outcomes, they worsen progression of disease outcomes (Hatzenbuehler et al., 2013). Importantly, a fundamental cause endures such that while mechanisms can be addressed, the fundamental cause will continue to adversely impact health outcomes unless it itself is addressed (Hatzenbuehler et al., 2013). Stigma can be considered a fundamental cause because stigma, related to a variety of identities and characteristics (e.g., sexual identity, mental health disorders), has been shown to be linked with adverse outcomes across domains (Hatzenbuehler et al., 2013). Stigma can therefore be considered a driver of health inequities. For example, experiences of stigma may reduce the likelihood of someone seeking healthcare or may affect how a healthcare professional interacts with someone and their subsequent care.

Earnshaw & Chaudoir's (2009) HIV stigma theory explains the role of stigma for PLHIV. They posit that there are three forms of HIV-related stigma: enacted, anticipated, and internalized (Earnshaw & Chaudoir, 2009). Although these three aspects of HIV-related stigma are related, they each represent an important and distinct component of the experience of HIV-related stigma.

Enacted stigma refers to PLHIV's experiences of prejudice and discrimination (Earnshaw & Chaudoir, 2009). This enacted stigma is largely consistent with Link and Phelan's (2001) conceptualization, focusing on the othering aspect of stigma. Enacted stigma includes any negative behaviors directed towards individuals living with HIV because of their HIV status. This can include microaggressions which are overt acts of discrimination against others such as HIV criminalization laws. However, it also includes microaggressions, a form of subtle or indirect discrimination, such as avoiding touching a person living with HIV.

Anticipated stigma refers to the expectation of prejudice and discrimination because of one's HIV status (Earnshaw & Chaudoir, 2009). Anticipated stigma often occurs when individuals are concerned about what would happen if their HIV status were known to others (Earnshaw & Chaudoir, 2009). Anticipated stigma can be driven by prior experiences of enacted stigma or through perceptions of society at large. An individual's HIV status does not need to be known by others for them to experience anticipated stigma and its effects. Anticipated stigma can arise from expectations about how one's close friends, acquaintances or even strangers treat PLHIV. This suggests that although someone may conceal their HIV status from others, they likely will still experience the effects of stigma, including anticipated stigma.

Internalized stigma occurs within the individual when negative stereotypes about a stigmatized attribute are internalized. Someone experiencing internalized stigma develops negative feelings or thoughts about themselves because of the devalued or stigmatized attribute (i.e., HIV) (Earnshaw & Chaudoir, 2009). For example, someone may internalize feelings of guilt or shame regarding their HIV status. This experience can affect all individuals living with HIV, regardless of disclosure status.

HIV-related stigma has important implications for the lived experiences of PLHIV including their experiences of anxiety. A 2016 meta-analysis of six studies found a moderate positive association between HIV-related stigma and anxiety such that greater reports of stigma were associated with greater anxiety symptoms (Rueda et al., 2016). Since then, further research has identified a link between HIV-related stigma and anxiety, such that stigma is associated with heightened experiences of anxiety (Brown et al., 2016; Skinta et al., 2019). Furthermore, one study has concurrently examined each aspect of

HIV-related stigma (i.e., enacted, anticipated, and internalized stigmas), finding that they positively predicted anxiety as a composite as well as individually (Demirel et al., 2018). However, extant research has not consistently shown these relationships. Indeed, one study has found enacted stigma to be associated with anxiety (Algarin et al., 2020), while another found no such relationship (Li et al., 2016). Other researchers found that while enacted stigma predicted anxiety, internalized stigma was a better predictor (Murphy et al., 2018). Similarly, other studies have found that internalized stigma is also associated with anxiety (Cramer et al., 2015; Garrido-Hernansaiz & Alonso-Tapia, 2020). In contrast, one study found that while anticipated stigma predicts anxiety, internalized stigma does not (Strodl et al., 2015). Collectively, these findings suggest that although HIV-related stigma is clearly implicated in anxiety among PLHIV, the mechanisms behind this relationship are not clearly understood.

Prior research has shown an association between HIV-related stigma and experiences of anxiety in PLHIV. However, when examining individual aspects of HIV-related stigma (i.e., enacted, anticipated, and internalized stigmas), this relationship becomes less clear. For this reason, the present study seeks to examine these three components of HIV-related stigma concurrently to understand the differential effects of each on anxiety. By doing so, this study adds to the limited body of research examining anxiety in PLHIV, adding an understanding of the varying experiences of stigma.

**Social Support**

Prior research has identified social support as a predictor of anxiety among PLHIV such that greater levels of social support are associated with lower anxiety (Familiar et al., 2016; Liu et al., 2013; Luo et al., 2020; Nyongesa et al., 2021). This has

raised proposals for considering social support as a key protective factor for the mental health of PLHIV.

One explanation for the relationship between social support and anxiety is the stress-buffering hypothesis which theorizes that social support buffers against the effect of stress by encouraging effective coping strategies and reinterpretation of events in a less threatening way (Cohen, 2004). The stress-buffering hypothesis has been applied to daily stressors experienced by PLHIV. One recent study found social support to moderate the relationship between discrimination and anxiety in PLHIV, such that the effect of discrimination on anxiety was reduced among those with high levels of social support (Braksmajer et al., 2018). However, research findings on the stress-buffering hypothesis for PLHIV have been mixed.

Existing studies examining stress and anxiety have indicated that although social support predicts anxiety in PLHIV, it does not moderate the relationship between stress and anxiety (Huang et al., 2020; Murphy et al., 2000). Likewise, one other study found that social support did not moderate the relationship between internalized stigma and discrimination and mental health concerns (including both anxiety and depression), even though social support independently predicted mental health concerns (Heywood & Lyons, 2016). Collectively, these studies raise questions about whether the stress-buffering hypothesis should be applied to our understanding of social support and the experiences of PLHIV.

Given the limited support for the stress-buffering hypothesis as applied to social support, other explanations for the relationship between social support and anxiety in PLHIV may be needed. According to HIV stigma theory, experiences of stigma may

themselves lower social support among PLHIV. Those without HIV stigmatize PLHIV to differentiate and distance themselves socially from those carrying the stigmatized attribute, namely HIV (Earnshaw & Chaudoir, 2009). This reduces the number of people available to provide social support (Earnshaw & Chaudoir, 2009). In addition, even family and friends who serve as sources of social support are not immune from entrenched negative attitudes and biases toward PLHIV. When experiencing enacted stigma from family and friends, PLHIV may also distance themselves from these individuals to protect their own wellbeing. Moreover, anticipated stigma can influence HIV status disclosure decisions, with individuals choosing to not disclose their status to reduce anticipated stigma (Demirel et al., 2018). Finally, internalized stigma may reduce an individual's openness to HIV status disclosure due to their own perceptions of HIV. In these cases, a person living with HIV may not have access to social support relevant to their HIV care or unique stressors.

Meta-analytic work has linked stigma to lowered social support (Rueda et al., 2016). In addition, one study longitudinally examined social support in people recently diagnosed with HIV and found that self-reported expectations of social support decreased after the diagnosis (Garrido-Hernansaiz & Alonso-Tapia, 2017). Therefore, it can be expected that HIV-related stigma is associated with a decrease in perceived social support amongst PLHIV.

Research has established that social support mediates the relationship between stigma and general mental health outcomes. For example, studies have found that increased levels of stigma are associated with decreased social support, which in turn are associated with worsened mental health outcomes (Chan & Mak, 2019; Logie et al.,

2019). Thus, social support may be an important mechanism by which stigma influences anxiety symptoms. One study examined this relationship in young Black MSM including those living with and without HIV (Bauermeister et al., 2018). They found that for young Black MSM living with HIV, social support mediated the relationship between enacted racial and sexual identity stigma and psychological distress (i.e., anxiety and depression). However, internalized sexual identity stigma (i.e., homonegativity) did not predict anxiety nor did social support mediate the relationship. Among the MSM not living with HIV, internalized and enacted stigmas were associated with greater anxiety, but social support did not mediate the relationships (Bauermeister et al., 2018). This suggests that the experience of racial and sexual identity stigma may impact social support differentially for those living with HIV compared with those not living with HIV. In addition, internalized and enacted stigma may operate on anxiety through different mechanisms, highlighting the importance of examining these related concepts individually. Therefore, to understand the mechanisms behind anxiety in PLHIV, the relationships must be examined within this population specifically. Although this research supports the conceptualization of social support as a mechanism through which stigma operates among PLHIV, it focuses on experiences of stigma related to race and sexual identity. To the author's knowledge, no extent research has examined whether the relationship between HIV-related stigma and anxiety is mediated by social support. The present research seeks to fill this gap.

**Present Study**

The present study aims to fill the current gaps in the literature related to experiences of stigma, social support, and anxiety amongst PLHIV. Specifically, there

are three aims. First, this study aims to compare experiences of HIV-related enacted, anticipated, and internalized stigma amongst PLHIV of various backgrounds including gender, sexual identity, and age. Second, this study seeks to compare experiences of anxiety amongst PLHIV of various backgrounds including gender, sexual identity, and age. Finally, uniting our understanding of HIV stigma theory and the conceptualization of stigma as a fundamental cause, this study seeks to determine whether HIV-related enacted, anticipated, and internalized stigma predict anxiety symptoms through self-perceived social support.

# CHAPTER 2: METHOD

## Procedures

This study utilizes data that were collected from May to September of 2018. The study's protocol was approved by the University of South Carolina's Institutional Review Board. To be eligible for the study, participants were 18 years or older, living with HIV, and willing to complete the 35-40 minute survey. Participants were recruited for the study from a large immunology center in Columbia, South Carolina. Clinic staff assisted with recruitment, introducing the study to patients at the clinic and directing those who voiced an interest to a member of the research team. The research team member invited the participants to complete an anonymous survey designed to obtain information about the health behaviors of PLHIV and then obtained informed consent. The majority of invited participants (>80%) chose to enroll in the study. Participants completed the paper and pencil survey at the clinic. No personally identifying information was collected, and participants were informed that any question could be skipped. All participants received a $20 gift card as compensation for their participation. A total of 402 participants completed the survey.

## Measures

Appendix A includes a list of all measures including items and Likert scale response options used in the study's survey. A detailed explanation of each measure follows.

### *Anxiety*

Anxiety was measured with the Generalized Anxiety Disorder Scale-7 (GAD-7), a seven-item screening tool for generalized anxiety, which can be used to determine who may need further evaluation and is frequently used in research to estimate the prevalence of anxiety (Spitzer et al., 2006). Participants were asked to respond to seven items on a 4-point scale (0 = *not at all*, 3 = *nearly every day*) indicating their anxiety symptoms for the past 2 weeks. Example items include "feeling nervous, anxious, or on edge" or "worrying too much about different things". Scores were calculated using the sum of all item responses, with scores ranging from 0 to 21. A score of 10 is considered a cut-point for identifying cases of generalized anxiety disorder (Spitzer et al., 2006). The scale also can indicate anxiety symptom severity, with the following categorizations: 5-9 mild, 10-14 moderate, 15+ severe (Spitzer et al., 2006). This measure has previously been used with PLHIV (e.g., Beer et al., 2019). This measure has been found to have excellent reliability and good construct validity (see Spitzer et al., 2006). In the present study, internal reliability was acceptable ($\alpha$= .94).

### *HIV-Related Stigma*

The 12-item shortened version of the HIV Stigma Scale was used to assess stigma (Berger et al., 2001; Reinius et al., 2017). Participants responded on a 4-point scale (1 = *strongly disagree* to 4 = *strongly agree*), indicating the extent to which they experienced several aspects of stigma, with higher scores indicating more experiences of stigma. The original scale has four subscales: (1) personalized stigma, (2) disclosure concerns, (3) concerns about public attitudes, and (4) negative self-image (Reinius et al., 2017). Earnshaw and Chaudoir (2009), who conceptualized the HIV Stigma Framework, have

indicated that these four subscales map onto their conceptualization of enacted, anticipated, and internalized stigma, as detailed below.

On the HIV Stigma Scale, enacted stigma is measured through the personalized stigma subscale which includes three items. Specifically, participants are asked to rate the extent to which they agree with the following statements "Some people avoid touching me once they know I have HIV", "People I care about stopped calling after learning I have HIV", and "I have lost friends by telling them I have HIV". Internal reliability for enacted stigma was acceptable in the current study (α= .83).

Anticipated stigma is measured through the disclosure concerns and concerns about public attitudes subscales, including a total of six items. Participants are asked to report the extent to which they perceive the need to keep their HIV status a secret and the way in which others treat someone with HIV. Sample items include "Telling someone I have HIV is risky", "Most people are uncomfortable around someone with HIV" and "People with HIV are treated like outcasts". Internal reliability for anticipated stigma in the current study was acceptable (α= .85).

Internalized stigma is measured through the negative self-image subscale which includes three items. Participants are asked to rate the extent to which they agreed with the following statements "I feel guilty because I have HIV", "People's attitudes about HIV make me feel worse about myself", and "I feel I'm not as good a person as others because I have HIV". Internal reliability for internalized stigma was acceptable (α= .80).

***Social Support***

Social support was measured through the 19-item Medical Outcomes Study (MOS) Social Support Survey (Sherbourne & Stewart, 1991). This measure was

developed for use with individuals with chronic health conditions (Sherbourne & Stewart, 1991) and has been used in research with PLHIV (Qiao et al., 2014). Participants are asked to indicate how often various aspects of social support were available to them on a 5-point scale (0 = *none of the time*, 4 = *all of the time*). This scale includes subscales on emotional/information support, tangible support, affective support, and positive social interactions. Emotional/information support includes having someone who listens and provides advice to you. For example, one item is "someone to confide in or to talk about yourself or your problems". Tangible support includes help with tasks such as getting to the doctor or preparing meals when unable to do so oneself. For example, participants are asked to indicate how often they had "someone to help you if you were confined to bed". The affective support subscale includes demonstrations of love and affection such as "someone who hugs you". Finally, the positive social interaction subscale asks about those with whom someone can have good positive interactions. For example, participants are asked to indicate how often they have "someone to do something enjoyable with". Scores were calculated using the sum of all 19 items, with scores ranging from 0 to 77. Information on reliability and validity of the scale has been previously published (Sherbourne & Stewart, 1991). Internal reliability in the present study was acceptable (α= .98).

***Sociodemographic and HIV-Related Variables***

Participants were also asked to report their sociodemographic information. Specifically, participants reported their current gender, race, and ethnicity on multiple choice questions with the option to self-describe an unlisted identity. For race, "African American or Black" was included as a single response option. Therefore, this category

encompasses both those who identify African American as well as those who identify as Black such as those from born in countries outside of the United States. In addition, participants reported their sexual identity, marital status, and highest level of education with multiple choice response options. Participants also reported the month and year that they first tested positive for HIV.

# CHAPTER 3: RESULTS

## Data Cleaning

Data cleaning and preliminary analyses were completed in R. For descriptive analyses and aims 1 and 2, composite scores were calculated for HIV-related stigmas (enacted, anticipated, internalized), social support, and anxiety. If a single item on the scale was missing the individual's mean response on the remainder of scale items was used to calculate the composite. If more than one item was missing, listwise deletion was used for the correlational analyses and analyses of variance. Analyses for aim 3 were conducted in Mplus (Version 8.1) using full information maximum likelihood (FIML) estimates to manage missing data.

## Descriptive Statistics and Correlations

Table 2.1 includes a full description of sociodemographic variables for the sample. The majority of the sample identified as male (64.50%) with 33.75% identifying as female. In terms of race, the majority of the sample were African American or Black (78.00%), with 16.75% identifying as White. A small portion (4.82%) were Latinx. The sample was relatively mixed with regard to sexual identity, with 46.60% identifying as heterosexual or straight, 41.62% as gay or lesbian, and 10.73% as bisexual. Most reported never being married (58.66%). Most participants reported having completed 12$^{th}$ grade or earning their GED (31.32%) or having attended at least some college, including earning an associate's or technical degree (34.34%). However, a significant portion (15.26%) of

the sample did not earn a high school degree or GED. The mean age of the sample was 44.31 years old (*SD* = 13.69), with about half (51.55%) of participants reporting being between 40 and 59 years of age. Many of the participants had been living with HIV for an extended period of time, with the mean years since diagnosis being 12.75 years (*SD* = 9.23). A sizeable portion of the sample (12.76%) reported living with HIV for more than 25 years, indicating that this sample includes many long-term survivors.

A bivariate partial correlation matrix was calculated for all continuous variables with full results in Table 2.2. Significant bivariate correlations were found for age and anxiety ($r$ = -.22, $p$ < .0001). Age was not significantly correlated with any other variables ($p$ > .05). Enacted stigma was significantly correlated with anticipated stigma ($r$ = .23, $p$ < .0001), internalized stigma ($r$ = .22, $p$ < .0001), social support ($r$ = -.13, $p$ = .02 ), and anxiety ($r$ = .21, $p$ < .0001). Anticipated stigma was significantly correlated with internalized stigma ($r$ = .43, $p$ < .0001) and social support ($r$ = .12, $p$ = .02), but not anxiety ($p$ > .05). Internalized stigma was significantly correlated with social support ($r$ = -.12, $p$ = .035) and anxiety ($r$ = -.22, $p$ < .0001). Social support and anxiety were also significantly correlated ($r$ = -.13, $p$ = .015).

**Aim 1: Experiences of HIV-related Enacted, Anticipated, and Internalized stigmas**

Overall, the present sample reported a mean score of 1.92 for enacted stigma (*SD* = 0.86), 2.73 for anticipated stigma (*SD* = .81) and 1.91 for internalized stigma (*SD* = .88) on a four-point Likert scale (1 = strongly disagree to 4 = strongly agree) that was ordered in such a way that higher scores indicated more stigma.

To assess the prevalence of HIV-related enacted, anticipated, and internalized stigmas by sociodemographic variables, a two-way Multivariate Analysis of Variance

(MANOVA) was conducted, with gender and sexual identity (Straight Man, Gay/Bisexual Man, Straight Woman) and age (young [20 – 39 yrs], middle aged [40-59 yrs], older [60+ years]) as independent variables and HIV-related anticipated, enacted, and internalized stigma as the dependent variables. Because the majority (78%) of participants identified as Black or African American, race was not included in these analyses due to a lack of power to detect differences between Black and African American individuals and those of other races.

Wilk's lambda was used as the test statistics for the MANOVA. The results indicated a significant interaction between gender and sexual identity and age on at least one of aspects of HIV-related stigma ($\lambda(6,320) = 0.87, p = .0006$). Gender and sexual identity were not a significant predictor ($\lambda(3,320) = .98, p = .56$), nor was age ($\lambda(2,320) = .96, p = .06$). Of note, results were somewhat consistent across test statistics (Roy's Largest Root, Wilk's lambda, Hotelling-Lawley, Pillai); however, age was a significant predictor at the $\alpha = .05$ level with Roy's Largest Root.

To determine which aspect of stigma (e.g., enacted, anticipated, internalized stigma) was predicted by the interaction of gender and sexual identity and age, follow up analyses of variances (ANOVA) were conducted for each dependent variable. Table 2.3 contains the statistics for the MANOVA and follow up ANOVAs. Summary statistics of enacted, internalized, and anticipated stigmas by sociodemographic groupings are included in Table 2.4.

No differences were detected in levels of enacted stigma for gender and sexual identity ($F(3, 325) = 1.35$, $p = .26$), age ($F(2, 326) = 1.38$, $p = .25$), nor their interaction ($F(6, 325) = 0.40$, $p = .88$).

Anticipated stigma was predicted by the interaction of gender and sexual identity and age ($F(6, 325) = 3.94$, $p = .0008$, $\eta^2 = .07$). Gender and sexual identity ($F(3, 325) = 0.216$, $p = .88$) and age ($F(2, 325) = 1.95$, $p = .14$) alone did not significantly predict internalized stigma. Tukey's HSD was calculated to determine where the difference in experiences of anticipated stigma lay. Young straight men reported higher levels of anticipated stigma ($M = 3.53$, $SD = 0.58$) than young bisexual men ($M = 2.45$, $SD = 0.76$) ($p = .049$). Middle aged straight women reported higher levels of anticipated stigma ($M = 2.71$, $SD = 0.73$) than middle aged straight men ($M = 2.58$, $SD = 0.80$) ($p = .029$). Middle aged gay men reported higher levels of anticipated stigma ($M = 2.71$, $SD = 0.73$) than middle aged straight men ($M = 2.58$, $SD = 0.80$) ($p = .029$). Bisexual older men reported higher levels of anticipated stigma ($M = 3.64$, $SD = 0.51$) than straight older men ($M = 2.50$, $SD = 0.83$) ($p = .04$).

Internalized stigma was predicted by the interaction of gender and sexual identity and age ($F(6, 327) = 3.734$, $p = .001$, $\eta^2 = .06$). Gender and sexual identity ($F(3, 327) = 0.436$, $p = .74$) and age ($F(2, 327) = .136$, $p = .87$) alone did not significantly predict internalized stigma. Tukey's HSD was calculated to determine where the difference in experiences of internalized stigma lay. Specifically, older bisexual men reported higher levels of internalized stigma ($M = 3.00$, $SD = 0.84$) than young bisexual men ($M = 1.45$, $SD = 0.80$) ($p = .01$), middle aged gay men ($M = 1.84$, $SD = 0.53$) ($p = .03$) and older gay men ($M = 1.192$, $SD = 0.38$) ($p = .02$). No other significant differences were detected in experienced internalized stigma.

**Aim 2: Experiences of Anxiety**

The mean level of anxiety as measured by the GAD-7 in this sample was 5.58 (*SD* = 6.07 ) (i.e., possible range of 0 to 21), representing a mild level of anxiety symptoms, below the clinical cut-off of 10 (Spitzer et al., 2006). The median level of anxiety as measured by the GAD-7 was 4 (Spitzer et al., 2006). However, 22.2% (*n* = 77) of participants reported anxiety symptoms meeting or surpassing the clinical cutoff point of 10.

To assess the prevalence of anxiety by sociodemographic variables, a two-way ANOVA was conducted with gender and sexual identity (Straight Man, Gay/Bisexual Man, Straight Woman) and age (20 – 39 yrs, 40-59 yrs, $\geq$60 years) as independent variables and anxiety as the dependent variable. Because the majority (78%) of participants identified as Black or African American, race was not included in these analyses due to a lack of power to detect differences between Black and African American individuals and others.

The results of the ANOVA are found in Table 2.5. There were significant differences in experiences of anxiety by age ($F(2, 326) = 3.37$), $p = .04$), but not by gender and sexual identity ($F(3,326) = 1.05$, $p = .37$). No interaction was present ($F(6, 326) = 1.42$, $p = .21$). Tukey's HSD was calculated to determine where the age difference in experiences of anxiety lay, revealing no significant differences at the $\alpha = .05$ level. However, younger individuals tended to report higher anxiety symptoms ($M = 6.63$, $SD = 6.31$) than middle aged individuals ($M = 4.94$, $SD = 5.67$) ($p = .052$). The means and standard deviations of anxiety symptoms by sociodemographic groupings are found in Table 2.6.

**Aim 3: Predictive Role of Stigma through Social Support on Anxiety**

To examine the relationship between HIV-related enacted, anticipated, and internalized stigma, social support, and anxiety symptoms, a multiple mediation model was analyzed using path analysis in Mplus (Version 8.1). Full information maximum likelihood (FIML) estimation was used to handle missing data.

Several measures were employed to measure model fit. First, - 2 log likelihood for the model was 33,618.20 compared with 29,362.47 for the fully saturated model. Absolute fit of the model was poor ($\chi^2(655) = 2967.07, p < .0001$)and comparative fit indices yielded mixed results. That is, though the root mean square error of approximation suggested only minor misfit (RMSEA = 0.055), other model fit measures indicated a poor fit (CFI = 0.77, TLI = .75). The model predicted a significant portion of the variance in social support ($R^2$ = .104, $p$ = .0004) and anxiety ($R^2$ = .263, $p$ < .0001).

Figure 2.1 includes the multiple mediator model tested. Social support was negatively predicted by enacted stigma (*B* = -.314, *SE* = 0.106, *p* = .003) and internalized stigma (*B* = -.312, *SE* = .106, *p* = .003). In contrast, anticipated stigma positively predicted social support (*B*=.311, *SE* = .11, *p* = .005). Anxiety was positively predicted by enacted stigma (*B* = .245, *SE* = .094, *p* = .009) and internalized stigma (*B* = .267, *SE* = .092, *p* = .004). Social support did not predict anxiety (*B* = -.08, *SE* = .048, *p* = .092) nor did anticipated stigma (*B* = 0.57, *SE* = .087, *p* = .513). The indirect effects through social support on anxiety were not significant for enacted stigma (*B* = .025, *SE* = .016, *p* = .123), anticipated stigma (*B* = -.025, *SE* = .016, *p* = .116), nor internalized stigma (*B* = .025, *SE* = .017, *p* = .138).

Table 2.1 Self-Reported Sociodemographic Characteristics of Participants

| | n | % |
|---|---|---|
| Gender | | |
| Female | 135 | 33.75 |
| Male | 258 | 64.50 |
| Self-Described | 6 | 1.50 |
| Prefer not to answer | 1 | 0.25 |
| Age in Years | | |
| 20 - 39 | 140 | 36.08 |
| 40 – 59 | 200 | 51.55 |
| 60+ | 48 | 12.37 |
| Race | | |
| American Indian or Alaskan Native | 2 | 0.50 |
| Asian | 4 | 1.00 |
| Black or African American | 312 | 78.00 |
| Native Hawaiian or Other Pacific Islander | 1 | 0.25 |
| White | 67 | 16.75 |
| Other | 14 | 3.50 |
| Ethnicity | | |
| Hispanic of Latino | 16 | 4.82 |
| Not Hispanic of Latino | 207 | 62.3 |
| Other | 109 | 32.83 |
| Sexual Identity | | |
| Heterosexual (straight) | 178 | 46.60 |
| Gay or Lesbian | 159 | 41.62 |
| Bisexual | 41 | 10.73 |
| Self-Described | 4 | 1.05 |
| Marital Status | | |
| Married | 40 | 12.16 |
| Cohabitation | 29 | 8.82 |
| Separated | 19 | 5.78 |
| Divorced | 34 | 10.33 |
| Widowed | 14 | 4.26 |
| Never Married | 193 | 58.66 |
| Education | | |
| Grades 1 – 8 | 4 | 1.2 |
| Grades 9 -11 | 47 | 14.16 |
| Grade 12 or GED | 104 | 31.32 |
| Some College, Associates, or Technical Degree | 114 | 34.34 |
| Bachelor’s Degree | 38 | 11.44 |
| Any postgraduate studies | 25 | 7.53 |
| Time Since Diagnosis in Years | | |
| < 5 years | 89 | 23.18 |
| 5 – 9 years | 83 | 21.61 |
| 10 – 14 years | 65 | 16.93 |
| 15 – 19 years | 51 | 13.28 |

| | | |
|---|---|---|
| 20 – 25 years | 47 | 12.24 |
| 25 – 29 years | 29 | 7.55 |
| 30 – 34 years | 15 | 3.91 |
| 35+ years | 5 | 1.30 |

Table 2.2 Descriptive Statistics and Partial Correlations of Study Variables

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| Age | 44.31 | 13.69 | — | | | | |
| Enacted Stigma | 1.92 | .86 | .06 | — | | | |
| Anticipated Stigma | 2.73 | .81 | -.05 | .23** | — | | |
| Internalized Stigma | 1.91 | .88 | .06 | .22** | .43** | — | |
| Social Support | 49.59 | 20.33 | -.04 | -.13* | .12* | -.12* | — |
| Anxiety | 5.58 | 6.07 | -.22** | .21** | .05 | .22** | -.13* |

*Note:* $N = 346$. * $p < .05$, ** $p < .01$.

Table 2.3 Multivariate and Univariate Analyses of Variance in Enacted, Internalized, and Anticipated Stigma

| | Multivariate (Wilks) | | Univariate | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Enacted Stigma | | | Anticipated Stigma | | | Internalized Stigma | | |
| Source | $\lambda$ | $p$ | $F$ | $F$ | $F$ | $F$ | $p$ | $\eta^2$ | $F$ | $p$ | $\eta^2$ |
| Gender & Sexual Identity | 0.98 | .56 | .216 | .216 | .216 | .436 | .74 | < .00 | .436 | .74 | < .00 |
| Age | 0.96 | .06 | 1.95 | 1.95 | 1.95 | .136 | .87 | < .00 | .136 | .87 | < .00 |
| Interaction | 0.87 | .0006 | 3.94 | 3.94 | 3.94 | 3.734 | .001 | .06 | 3.734 | .001 | .06 |

*Note: N = 332*

Table 2.4 Means and Standard Deviations of Enacted, Internalized, and Anticipated Stigma across Sociodemographic Categories

| | Straight Women | | Straight Men | | Gay Men | | Bisexual Men | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Enacted Stigma | | | | | | | | |
| 20-39 years old | 1.83 | 0.94 | 1.81 | 0.96 | 1.79 | 0.90 | 1.79 | 0.79 |
| 40-59 years old | 2.12 | 0.83 | 2.07 | 0.88 | 1.90 | 0.73 | 1.67 | 0.98 |
| 60+ years old | 2.02 | 0.84 | 1.70 | 0.48 | 1.28 | 0.49 | 1.72 | 0.83 |
| Anticipated Stigma | | | | | | | | |
| 20-39 years old | 2.86 | 0.65 | 3.53 | 0.58 | 2.79 | 0.83 | 2.45 | 0.76 |
| 40-59 years old | 2.71 | 0.73 | 2.58 | 0.80 | 2.71 | 0.73 | 2.58 | 0.91 |
| 60+ years old | 2.92 | 0.81 | 2.28 | 0.72 | 2.50 | 0.83 | 3.64 | 0.51 |
| Internalized Stigma | | | | | | | | |
| 20-39 years old | 1.79 | 0.83 | 2.37 | 1.00 | 1.88 | 0.91 | 1.45 | 0.80 |
| 40-59 years old | 2.02 | 0.82 | 2.03 | 0.55 | 1.84 | 0.53 | 1.78 | 0.84 |
| 60+ years old | 1.98 | 0.82 | 1.44 | 0.55 | 1.19 | 0.38 | 3.00 | 0.84 |

*Note: N = 332*

Table 2.5 Analysis of Variance in Anxiety Symptoms

| Anxiety | *F* | *df* | *p* | $\eta^2$ |
|---|---|---|---|---|
| Sexual and Gender Identity | 1.048 | 3,326 | .37 | <.00 |
| Age | 3.368 | 2,326 | .035 | .02 |
| Interaction | 1.416 | 6,326 | .207 | .03 |

*Note: N = 338*

Table 2.6 Means and Standard Deviations of Anxiety Symptoms Across

Sociodemographic Categories

| | Straight Women | | Straight Men | | Gay Men | | Bisexual Men | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Anxiety | | | | | | | | |
| 20-39 years old | 6.24 | 6.06 | 9.40 | 7.82 | 7.06 | 6.40 | 3.14 | 3.61 |
| 40-59 years old | 5.61 | 6.14 | 4.63 | 6.26 | 4.73 | 5.22 | 3.38 | 3.57 |
| 60+ years old | 4.30 | 5.76 | 3.30 | 6.47 | 5.30 | 6.11 | 7.11 | 3.78 |

*Note: N = 338*

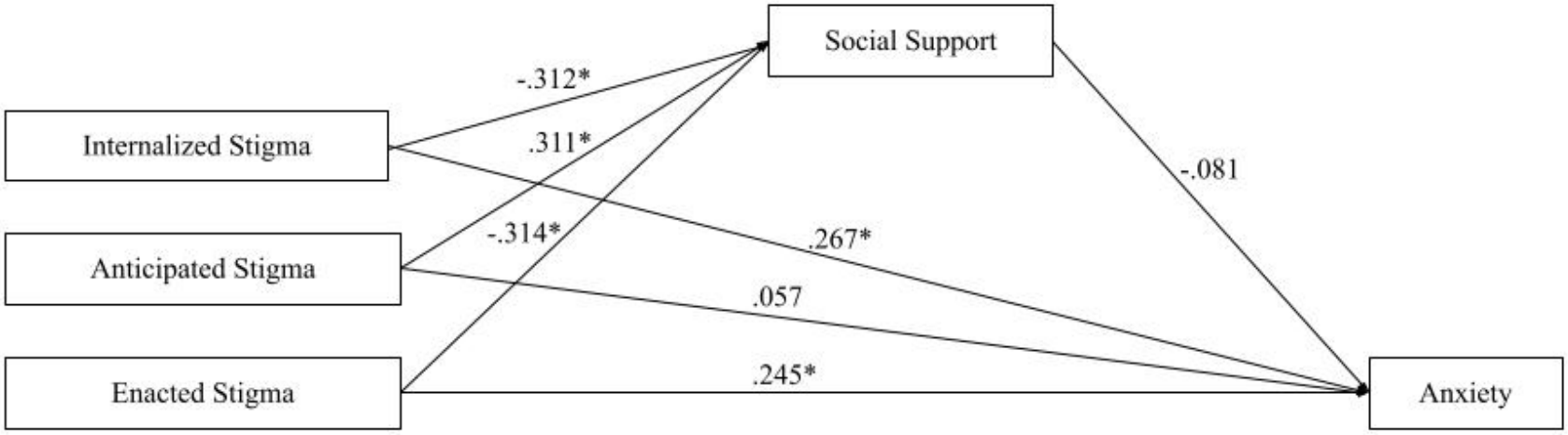


Figure 2.1 Multiple Mediation Model Examining Social Support as a Mediator of the Relationship Between Stigma and Anxiety

# CHAPTER 4: DISCUSSION

The present study sought to better understand the experiences of stigma, social support, and anxiety among PLHIV in Columbia, SC. In so doing, it fills important gaps in our understanding of psychosocial functioning in this key population, as well as ways in which to support these individuals. The study also makes an important contribution to the sparse existing literature on anxiety among PLHIV.

The sample included in this study was unique in several ways. The sample predominantly (78%) identified as Black or African American. Within the United States, the HIV epidemic disproportionately affects Black and African American communities. Indeed, 40% of those living with HIV are Black or African American, with 42% of new diagnoses in 2020 being for Black or African American individuals, despite representing a small share (13.6%) of the overall US population (CDC, 2022b; U.S. Census Bureau, 2021). This study's sample is therefore able to answer questions about this key population. In addition, a significant portion of the participants (34%) identified as women. Within the US, approximately 23% of PLHIV are women (CDC, 2022b). The present study's inclusion of women helps fill gaps in previous research which typically focus on MSM populations. Finally, this sample includes a significant portion of participants (12.37%) over the age of 60, with a mean age of 44.31 years old (*SD* = 13.69). Although the majority (57%) of new HIV diagnoses are made amongst young people (13-34 years old), a substantial portion (39%) of those living with HIV are 55 years old or older (CDC, 2022b). Moreover, with medical advances, PLHIV are living

longer and healthier lives and thus aging (Weinstein et al., 2021). This study examines the needs of PLHIV across the lifespan including during this crucial aging period.

Overall, self-reported experiences of stigma were relatively low, with individuals principally disagreeing with statements indicating experiences of stigma. This low report of experiences of stigma is likely impacted by the older age of the sample. Prior research has identified that PLHIV over the age 55 years report lower levels of stigma than PLHIV under the age of 40 years (Emlet et al., 2015). As such, a younger sample may have yielded different results with a higher prevalence of reported stigma.

Of note, experiences of anticipated stigma were higher than enacted and internalized stigma. There are several potential explanations for this finding. For example, anticipation of stigma may be more prevalent than enacted or internalized stigma. However, at the same time, anticipation of stigma may occur due to a lack of disclosure to others. This may reduce the enacted stigma a person experiences without necessarily meaning they would not encounter said stigma if they were to disclose their HIV status. Regardless of the explanation of the higher levels of anticipated stigma, these expectations are still important in understanding the lived experiences of PLHIV. Anticipated stigma is shaped by actual experiences as well as societal-level perspectives and attitudes towards HIV (Earnshaw & Chaudoir, 2009). Therefore, while someone may have low experiences of enacted stigma due to withholding their HIV status from others or limiting their social network, they still may experience negative effects of stigma due to anticipation of said stigma within the general population.

To better understand whether particular sociodemographic groups are at heightened risk for HIV-related enacted, anticipated, and internalized stigma, this study

examined differences in reported stigma by sociodemographic grouping. No differences were detected in experiences of enacted stigma by gender and sexual identity or age. This suggests that regardless of these characteristics, PLHIV in the current sample experience similar levels of enacted stigma. This is consistent with prior research finding no effect of age on enacted stigma (Emlet et al., 2015).

Differences were detected by sociodemographic characteristics on anticipated stigma. While young straight men reported higher levels of anticipated stigma than young bisexual men, the opposite was true for older straight and bisexual men. This suggests that experiences of bisexual and straight men differ by age. This may be due to differences in sociocultural environments by age and sexual identity. In addition, middle-aged straight men reported lower anticipated stigma than middle-aged straight women and middle-aged gay men. As such, particular attention should be placed towards middle-aged straight women and gay men in addressing anticipated stigma and its consequences. This slightly contrasts with prior research finding that women and those identifying as heterosexual or bisexual reported higher anticipated stigma (Emlet et al., 2015). It may be that age is an important component in understanding this relationship. In addition, the present research suggests that gender and sexual identity should be considered concurrently when considering the effects of stigma. Future research should use an intersectional lens to better understand these relationships.

Differences were detected by sociodemographic characteristics on internalized stigma. Older bisexual men reported high levels of internalized stigma compared with young bisexual men and middle-aged and older gay men, suggesting that older bisexual men may be at particular risk for the development of internalized HIV-related stigma.

This contrasts with prior findings which have identified that older PLHIV (55+ years old) experience lower levels of internalized stigma than younger PLHIV (Emlet et al., 2015). The present research accounts for sexual identity, highlighting a potential vulnerability for bisexual men during this aging period. Furthermore, the present study found no differences between older bisexual men and older straight women and younger gay or bisexual men or straight women. Therefore, these findings suggest that older age may not be protective against internalized stigma. Age and individualized experiences should be considered when assessing risk factors for developing anxiety among people living with HIV.

Collectively, these findings demonstrate the importance of considering HIV-related stigma within the context of individual lived experiences. In addition, each component of stigma (i.e., enacted, anticipated, internalized) must be considered independently as the patterns in experiences varied by type of HIV-related stigma. While the present study examined the role of HIV-related stigma specifically, it is also important to note that PLHIV frequently carry other stigmatized identities including sexual and gender minorities, racial minorities, and other identities. Thus, an individual's other stigmatized identities may shape and enhance the experiences of HIV-related stigma. Therefore, clinicians and researchers must consider these characteristics when examining the role of HIV-related stigma in individual's experiences.

These findings have important implications for the care of PLHIV. Although all PLHIV may experience HIV-related stigma, the present findings indicate that across the lifespan there are certain demographic groups who report higher levels of stigma. Moreover, the patterns of stigma differed by type of stigma, suggesting that it is

important for providers to recognize individual experiences. Although the present study did not examine intersectional stigma, intersecting identities likely shape the experience of HIV-related stigma. Clinicians working with PLHIV should recognize potential for intersectional stigma influencing lived experiences of PLHIV. In addition, future research ought to use intersectional stigma measures to examine these experiences.

Stigma reduction efforts are needed to address the needs of PLHIV. These stigma reduction interventions can occur on a community, organizational, and individual level. On a societal level, stigma reduction can include actions such as changing policies and other legal interventions (Heijnders & Van Der Meij, 2006). For example, this could include repealing HIV criminalization laws. On a community level, stigma reduction often includes education about HIV as well as increasing interpersonal contact between those with and without HIV to reduce perceived differences (Heijnders & Van Der Meij, 2006).

On an organizational level, a variety of stigma reduction interventions have been tested. These stigma reduction efforts typically involve an educational component to debunk myths about HIV as well as other strategies such as perspective-taking and interactive opportunities with PLHIV (Mak et al., 2017). A recent meta-analysis found that stigma reduction interventions improve both participant's knowledge of HIV and their attitudes towards PLHIV (Mak et al., 2017). Common elements for interventions which were more effective were those working with professional samples (e.g., medical professionals), those with multiple sessions rather than a single session, and those that were conducted in community settings (Mak et al., 2017). Involvement of interactive components and use of contact with PLHIV did not predict the intervention effectiveness

(Mak et al., 2017). Therefore, in addressing stigma, it is crucial for organizations to provide repeated stigma reduction and educational opportunities.

When considering internalized HIV-related stigma, a different set of interventions is appropriate. Cognitive behavioral therapy (CBT) has been found to be effective in reducing HIV-related internalized stigma (Tshabalala & Visser, 2011). CBT is based on a cognitive model which asserts that individual's automatic thoughts about situations influences their reaction and corresponding emotions, behaviors, and physiological responses (Beck, 2011). CBT addresses cognitive distortions by having people identify how realistic their automatic thoughts are (Beck, 2011). In addition, it uses behavioral changes and problem-solving skills to address concerns (Beck, 2011). A recent systematic review identified that other common individual-level interventions for internalized stigma including health education and behavioral interventions had little effect on internalized stigma (Pantelic et al., 2019). Therefore, in addressing internalized stigma, it is important for PLHIV to have access to evidenced based approaches such as CBT through integrated mental health services.

Although research has identified ways to support PLHIV with HIV-related stigma, a recent review highlighted that extant research has not examined intersectional stigma reduction interventions (Andersson et al., 2020). The current research highlights that those with different sociodemographic characteristics have varying experiences of HIV-related stigma. Therefore, future research should examine interventions focused on intersectional stigma reduction to best meet the varying needs of PLHIV.

A recent review identified a gap in the literature regarding stigma-reduction, noting that there is a lack of research on stigma reduction among health professionals

beyond HIV care specialists (Andersson et al., 2020). With many PLHIV aging, they will need access to a variety of care providers. Given this increasing need for care for aging PLHIV, care providers outside of HIV specialists need to have competency when working with this population. Future research should examine stigma reduction interventions across a variety of healthcare settings.

This sample included a large percentage (22%) of individuals screening positively for clinical levels of anxiety symptoms, indicative of the potential for generalized anxiety disorder or other anxiety disorders (e.g., panic disorder, social phobia). This large proportion of individuals reporting high levels of anxiety symptoms far surpasses the US general population prevalence of 2.9% (APA, 2022). This is consistent with prior research that has found a heightened prevalence of anxiety amongst PLHIV (Beer et al., 2019). Moreover, the mean score of anxiety symptoms could be considered within the 'mild' range. Thus, even those who do not have clinical levels of anxiety symptoms may experience subclinical yet distressing anxiety symptoms. This is noteworthy given that the sample was recruited from those currently engaged in high quality HIV care. Thus, even amongst those with access to HIV care services, there is a heightened level of anxiety and a corresponding need for services. Prevalence of anxiety disorders may be higher within the general population of PLHIV who are not engaged in care. Clinicians working with PLHIV should familiarize themselves with the presentation of anxiety disorders. For example, the APA has several training videos detailing common mental health conditions experienced by PLHIV (APA, n.d.).

High quality mental health services should be integrated with HIV care to support the overall wellbeing of PLHIV as well as potentially improve HIV care outcomes. For

example, CBT is an effective treatment for anxiety which could be integrated with HIV care. Meta-analyses have found CBT to be effective in both clinical trials and effectiveness trials (Deacon & Abramowitz, 2004; Stewart & Chambless, 2009). In addition, the use of CBT for anxiety is effective with PLHIV (Spies, Asmal, & Seedat, 2013).

Many of the anxiety symptoms reported through the GAD-7 can also be indicative of trauma responses. For example, hypervigilance, a common response to trauma exposure, could be captured by the GAD-7's item "feeling nervous, anxious, or on edge" (APA 2022; Spitzer et al., 2006). Many PLHIV have experienced traumatic events throughout their lives. Indeed, a recent meta-analysis estimated a global prevalence of PTSD amongst PLHIV of 28% (Tang et al., 2020). Therefore, it may be that some of the individuals screening positively for anxiety are experiencing trauma related disorders. Mental health providers working with PLHIV should screen for trauma. When individuals report trauma experiences, evidence-based treatments such as trauma focused CBT, prolonged exposure therapy, or cognitive processing therapy should be used (Department of Veteran Affairs, 2017).

Although age was a predictor of anxiety symptoms, pairwise comparisons did not reveal any differences in anxiety symptoms when an alpha level of .05 was used. A slight trend towards younger individuals experiencing greater levels of anxiety than middle aged individuals was present ($p$ = .052). In contrast, within the general population, there is an inverted 'u' relationship with generalized anxiety disorder, such that the greatest number of individuals living with generalized anxiety disorder are in middle age (APA, 2022). Future research should further examine the relationship between age and anxiety

symptoms among PLHIV. It may be that the same psychosocial vulnerabilities experienced by PLHIV which heightens their risk for anxiety reduces the protective effect of young and older age. Thus, these individuals who are living with HIV may be at heightened risk for anxiety disorders compared with their peers in the general population.

In prior research, prevalence of anxiety has been found to be higher in women compared with men (APA, 2022). Likewise, gay and bisexual men have higher rates of anxiety compared with the general population (Meyer, 2003). In contrast, in the present study, no differences were detected in anxiety symptoms by gender and sexual identity. This suggests that PLHIV regardless of their stated gender or sexual identities are at risk for developing anxiety symptoms. As such, practitioners should ensure they are providing adequate support for all PLHIV in care, not simply those who carry other 'risk' factors such as gender or sexual minority status. Moreover, the present research re-iterates the heightened prevalence of anxiety amongst PLHIV, suggesting that this population is particularly prone to experiences of anxiety disorders.

Those working with PLHIV such as medical and mental health professionals should be aware of the higher rates of anxiety among this population. PLHIV who screen positively for anxiety symptoms must be properly referred to evidence-based mental health services. This will support the overall wellbeing of PLHIV and has the potential to improve HIV care outcomes. We echo recent calls for the integration of mental health screenings and care alongside HIV care (Remien et al., 2019). Screening is not only appropriate but is necessary to ensure access to services for those who need them. Indeed, the present study demonstrates the importance of the Fast Track Cities initiative's

inclusion of mental health treatment as a means of addressing the HIV epidemic (IAPAC, 2022).

As expected given HIV stigma theory, HIV-related stigma was related to anxiety symptoms. Specifically, internalized and enacted stigma positively predicted anxiety such that experience of these stigmas was associated with heightened anxiety symptoms. This is largely consistent with prior research which has found positive associations between each component of stigma and anxiety (Demirel et al., 2018). This study also adds to the literature which demonstrates a link between internalized stigma and anxiety (Cramer et al., 2015; Garrido-Hernansaiz & Alonso-Tapia, 2020). In addition, it adds to the literature demonstrating a link between enacted stigma and anxiety, building evidence that there is a link between these two realms (Algarin et al., 2020).

Contrary to expectations based on HIV stigma theory, anticipated stigma did not predict anxiety symptoms. This contrasts with prior research which found anticipated stigma to be positively associated with anxiety (Demirel et al., 2018; Strodl et al., 2015). There are several potential explanations for this finding. First, the present study may have been underpowered to detect effects. In addition, anticipated stigma, by definition, is the expectation of other's perceptions of HIV and corresponding reactions (Earnshaw & Chaudoir, 2009). This anticipation does not necessarily map onto actual experiences and may be a lesser stressor than other aspects of HIV-related stigma. Moreover, it may be that those with high levels of anticipated stigma have not disclosed their HIV status to others, leading to fewer stressors which may confer vulnerability for anxiety. Alternatively, it may be that perceptions of the general public's attitude towards HIV does not equate to the sociocultural surroundings of PLHIV. For example, while someone

may have endorsed the item “most people believe a person who has HIV is dirty”, they may not have agreed that most people they knew or interacted with believed that statement. Therefore, it may be that the present measure lacked sensitivity to examine anticipated stigma. Finally, it is noted that anticipated stigma was correlated with anxiety, suggesting that it may be that anticipated stigma is related to anxiety but not above and beyond the other components of stigma examined in the multiple mediator model.

The present findings related to HIV-related stigma predicting anxiety is consistent with prior research which has found a relationship between stigma and anxiety (Brown et al., 2016; Demirel et al., 2018; Rueda et al., 2016). However, this research adds to the prior research by determining that while internalized and enacted stigma were important predictors of anxiety, anticipated stigma was not. Thus, in future research, it is important for researchers to include measures of each component of stigma as they have differential relationships with the outcomes.

Given the way in which stigma has been shown to be associated with anxiety symptoms, mental health professionals must have competency in working with marginalized and stigmatized groups. Mental health professionals should be careful to avoid stigmatizing PLHIV during the therapeutic process and should adopt the use of person-first and non-stigmatizing language. Clinicians should refer to the UNAIDS terminology guidelines to ensure use of appropriate language (UNAIDS, 2015). In addition, mental health professionals should be familiar with facts surrounding HIV and be able to debunk potential myths. Continuing education opportunities and trainings should be made available for mental health providers to better understand HIV and to debunk myths.

Contrary to expectations from HIV stigma theory and the conceptualization of stigma as a fundamental cause, the present study indicated that social support did not mediate the relationship between enacted, anticipated, or internalized stigma on anxiety symptoms. Indeed, while each aspect of stigma was associated with social support, social support was not related to anxiety symptoms. While this was, to the author's knowledge, the first study to explore social support as a mediator for the relationship between HIV-related stigma and anxiety, the findings were somewhat inconsistent with prior research examining similar relationships. Specifically, the present findings contrast with work that has identified social support as a mediator between HIV-related stigma and general mental health outcomes amongst PLHIV (Chan & Mak, 2019; Logie et al., 2019). In addition, findings were inconsistent with research identifying social support as a mediator between enacted racial and sexual identity stigma and psychological distress (Bauermeister et al., 2018). Of note, these prior bodies of work have examined mental health in general, without a focus on anxiety, suggesting that there may be different pathways involved for different mental health disorders. Alternatively, it may be that different types of stigmas operate through different mechanisms. The present study may also have lacked sufficient power to detect the potential mediation of social support.

Although each aspect of stigma was associated with social support, the direction of these effects varied by type of stigma. Specifically, enacted and internalized stigma were negatively associated with social support, such that those with greater experiences of enacted and internalized stigma reported lower levels of social support. In contrast, anticipated stigma was positively associated with social support, indicating that those who anticipated greater amounts of stigma from others actually reported higher levels of

social support. These differential findings between the types of HIV-related stigma on social support highlight the importance of research examining the role of each component of stigma when understanding the relationship between stigma and social support.

There are several potential explanations for the present study's results. Those who anticipate high levels of stigma may choose to not disclose their HIV status to others and may consequently not lose social support. Alternatively, anticipated stigma may represent the expectations of stigma from the general public and not expectations from close family or friends who would provide social support.

To elucidate these relationships, future research should examine disclosure status as a part of understanding the relationship between stigma and social support. In addition, more sensitive measures should be used to examine anticipated stigma, with a focus on the anticipated source of stigma in addition to anticipated negative actions. Future research should also examine these relationships longitudinally.

The present study found that social support did not mediate the relationship between HIV-related stigma and anxiety. This finding was unexpected and may have been due to a lack of power to detect an effect. However, in the present study, HIV-related enacted, anticipated, and internalized stigma did predict reported social support. This suggests that while social support may not be implicated in anxiety, it is reduced amongst PLHIV who experience enacted and internalized stigma. Therefore, interventions such as peer support groups and peer navigators may be useful in helping PLHIV navigate challenges in their social lives. Social support has been implicated as a protective factor related to HIV disease progression (Kelly et al., 2014) as well as anxiety (Familiar et al., 2016; Liu et al., 2013; Luo et al., 2020; Nyongesa et al., 2021).

Therefore, it would be beneficial for PLHIV to have access to social support resources. This is likely especially the case for those who report a heightened level of enacted or internalized stigma.

**Limitations**

This study has several limitations. First, the cross-sectional nature of the survey does not allow for causal inferences or the temporal sequencing of events. Based on prior longitudinal research, it was expected that experiences of stigma would be associated with reductions in felt social support. However, the relationship between stigma and social support may be bidirectional. Indeed, reductions in social support could be considered an enacted stigma and may also lead to the anticipation of further experiences of stigma. Although the research questions addressed by the present study were informed by prior research and theory, the relationship between stigma and anxiety may also be bidirectional. For example, those who have a tendency towards anxiety symptoms (i.e., worry, rumination) may be more likely to internalized stigma or to perceive instances of enacted stigma. Future research should examine these relationships in a longitudinal manner to ascertain changes in anxiety following diagnosis along with changes in HIV-related stigma.

The present study does not examine disclosure status. Disclosure status is a potential mechanism behind the relationship between stigma and social support. According to Derlega and colleagues' (2004) model of HIV disclosure decision making, decisions to disclose one's HIV status depend on the social environment as well as individual relationships. The disclosure decision is based on the anticipation of someone's response to the disclosure. When anticipating that response, PLHIV consider

information about the individual as well as the overall cultural context. For example, someone experiencing high levels of anticipated stigma may choose not to disclose their status to others (Earnshaw & Chaudoir, 2009). This may explain why anticipated stigma was associated with heightened levels of social support. Therefore, future research should examine the role of disclosure status on the relationship between HIV-related stigma and social support.

There were also several limitations related to measurement used in this study. Participants self-reported their sociodemographic variables. Although this is commonly practiced, there is potential for incorrect responses. Nearly half (46.6%) of the sample identified as straight. This pattern of data is inconsistent with national and local prevalence data, which indicate that MSM represent the greatest portion of new HIV cases (71%) (CDC, 2022b). One explanation for this discrepancy could be participants reporting a straight identity rather than gay or bisexual identities due to sexual identity related stigma. Alternatively, sexual identity may not directly correlate directly with sexual behavior. As such, the findings comparing anxiety and stigma by sociodemographic variables should be interpreted with caution.

A substantial majority (78%) of the sample identified as Black or African American. This prevalence is consistent with the HIV epidemic within the United States as well as in South Carolina. However, because of the distribution of race within this sample, race was not included as a predictor of HIV-related stigma or anxiety. Intersectionality theory emphasizes the role of multiple identities in predicting experiences (Crenshaw, 2017). Racism has consistently been found to be predictive of general health and mental health outcomes (Paradies et al., 2015) as well as a predictor of

HIV outcomes (Doshi et al., 2021). Future research should examine the role of race and racism in the relationships examined in this study.

Berger's shortened HIV scale was used to measure HIV-related stigma (Berger et al., 2001). Although this approach was based on Earnshaw and Chaudoir's (2009) conceptualization of the HIV Stigma Framework, the scale was not originally intended to measure these three constructs. As a result, scales included a limited number of items for each measure (i.e., 3 - 6 items per scale), potentially limiting the validity of the measure. Future research ought to use additional questions to measure these constructs, such as has been conducted in prior research testing the HIV stigma framework (Earnshaw et al., 2013).

Anxiety was measured through a seven-item screener for generalized anxiety disorder. Although the GAD-7 has been demonstrated to have acceptable validity and reliability, its primary purpose is screening for anxiety. As such, a clinically significant score cannot be conflated with diagnosable generalized anxiety disorder. Future research should use a more comprehensive measure of anxiety symptoms, such as the Beck Anxiety Inventory (Beck, A.T., 1993). In addition, to determine the presence of a clinical generalized anxiety disorder, comprehensive psychological assessments would be necessary. Despite this limitation, the GAD-7 provides a snapshot of the experiences of PLHIV with anxiety symptoms.

The present study used the 19-item MOS social support survey (Sherbourne & Stewart, 1991). This scale includes subscales on emotional/information support, tangible support, affective support, and positive social interactions. In the present study, the overall score was used. While the scale had adequate internal reliability and this method

has been precedented in prior research (e.g., Watt et al., 2010), it may be that certain aspects of support are more important for predicting anxiety symptoms. For example, tangible support may help alleviate HIV-related stressors while emotional support may help an individual cope with HIV-related stressors. Future research should examine the role of each aspect of social support on anxiety symptoms. Indeed, it is possible that these different aspects of social support operate on anxiety through different mechanisms. In addition, the social support measure did not examine social support related to HIV specifically. Future research should explore these relationships. Findings would have implications for support groups and services provided through community and hospital-based HIV care clinics.

**Conclusions**

In this sample of PLHIV engaged in HIV care at a large immunology center in SC, over a quarter of individuals screened positive for anxiety disorder symptoms. Contrary to findings within the general population, gender, age, and sexual identity did not predict higher symptoms of anxiety within this sample of PLHIV. This suggests that regardless of sociodemographic characteristics, PLHIV are at heightened risk for anxiety disorders compared with their peers without HIV. These findings demonstrate the importance of conducting mental health screenings and providing mental health services to PLHIV. Mental health providers must be educated on the unique psychosocial experiences of PLHIV and best treatments for this population specifically.

HIV-related enacted and internalized stigma were predictors of anxiety symptoms. Mental health professionals should assess for experiences of enacted stigma as well as internal narratives around HIV in individuals living with HIV to better

understand their mental health experiences. When treating PLHIV with anxiety, mental health professionals should include stigma reduction to address these stressors experienced by PLHIV. In addition, given the role of enacted stigma in predicting anxiety symptoms amongst PLHIV, this research shows a high need for individual and community level stigma mitigation efforts to best support the psychosocial needs of PLHIV.

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# APPENDIX A: MEASURES

**Demographics.** Participants self-described their sociodemographic variables with the below response options.

1. Current Gender: Female, Male, Other (Specify _____), Prefer Not to Answer
2. Race: American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, Other (Please list_____).
3. Ethnicity: Hispanic or Latino, Not Hispanic or Latino, Other (Please list_____).
4. Sexual Identity: Heterosexual (straight), Gay or Lesbian, Bisexual, Other.
5. Marital Status: Married, Cohabitation, Separated, Divorced, Widowed, Never Married
6. Highest level of Education: Never attended school, Grades 1-8, Grades 9-11, Grade 12 or GED, Some college or Associate's Degree or Technical Degree, Bachelor's Degree, Any postgraduate studies.
7. Month and Year when First Tested Positive for HIV

**Anxiety.** Anxiety was measured on the GAD-7 (Spitzer et al., 2006). Participants responded to the following prompt "Over the past 2 weeks, how often have you been bothered by:" with response options 0 = not at all, 1 = several days, 2 = over half the days, 3 = nearly every day.

1. Feeling nervous, anxious, or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things

4. Trouble relaxing
5. Being so restless that it's hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen

**Internalized Stigma.** Internalized stigma was measured through selected items from Berger's Shortened HIV Stigma Scale (Berger et al., 2001; Reinius et al., 2017). Participants responded to the following prompt "Please tell us how much you agree with the following statements" with response options 1 = Strongly Disagree, 2= Disagree, 3 = Agree, 4 = Strongly Agree

1. I feel guilty because I have HIV
2. People's attitudes about HIV make me feel worse about myself
3. I feel I'm not as good a person as others because I have HIV.

**Enacted Stigma.** Enacted stigma was measured through selected items from Berger's Shortened HIV Stigma Scale (Berger et al., 2001; Reinius et al., 2017). Participants responded to the following prompt "Please tell us how much you agree with the following statements" with response options 1 = Strongly Disagree, 2= Disagree, 3 = Agree, 4 = Strongly Agree

1. Some people avoid touching me once they know I have HIV
2. People I care about stopped calling after learning I have HIV
3. I have lost friends by telling them I have HIV

**Anticipated Stigma.** Anticipated stigma was measured through selected items from Berger's Shortened HIV Stigma Scale (Berger et al., 2001; Reinius et al., 2017). Participants responded to the following prompt "Please tell us how much you agree with

the following statements" with response options 1 = Strongly Disagree, 2= Disagree, 3 = Agree, 4 = Strongly Agree

1. Telling someone I have HIV is risky
2. I work hard to keep my HIV a secret
3. People with HIV are treated like outcasts
4. Most people believe a person who has HIV is dirty
5. I am very careful who I tell that I have HIV
6. Most people are uncomfortable around someone with HIV.

**Social Support.** Social support was measured through the Medical Outcomes Study (MOS) Social Support Scale (Sherbourne & Stewart, 1991). Participants responded to the following prompt "How often is each of the following kinds of support available to you if you need it?" with response options 0 = none of the time, 1 = a little of the time, 2 = some of the time, 3 = most of the time, 4 = all of the time.

1. Someone you can count on to listen to you when you need to talk
2. Someone to give you information to help you understand a situation
3. Someone to give you good advice about a crisis
4. Someone to confide in or talk to about yourself or your problems
5. Someone whose advice you really want
6. Someone to share your most private worries and fears with
7. Someone to turn to for suggestions about how to deal with a personal problem
8. Someone who understands your problems
9. Someone to help you if you were confined to bed
10. Someone to take you to the doctor if you needed it

11. Someone to prepare your meals if you were unable to do it yourself

12. Someone to help with daily chores if you were sick

13. Someone who shows you love and affection

14. Someone to love and make you feel wanted

15. Someone who hugs you

16. Someone to have a good time with

17. Someone to get together with for relaxation

18. Someone to do something enjoyable with

19. Someone to do things with to help you get your mind off things