

HIV-Related Stigma, Social Support, and Symptoms of Mental Health Disorders Among People with HIV Initiating HIV Care in Cameroon

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Abstract

HIV-related stigma has been associated with poor mental health among people with HIV (PWH). Social support is a potentially modifiable factor that may buffer negative mental health sequelae of HIV-related stigma. Little is known about the extent to which the modifying effect of social support differs across mental health disorders. Interviews were conducted with 426 PWH in Cameroon. Log binomial regression analyses were used to estimate the association between high anticipated HIV-related stigma and low social support from family or friends and symptoms of depression, anxiety, post-traumatic stress disorder (PTSD), and harmful alcohol use, separately. Anticipated HIV-related stigma was commonly endorsed with ~80% endorsing at least 1 of 12 stigma-related concerns. In multivariable analyses, high anticipated HIV-related stigma was associated with greater prevalence of symptoms of depression {adjusted prevalence ratio (aPR) 1.6 [95% confidence interval (CI) 1.1–2.2]} and anxiety [aPR 2.0 (95% CI 1.4–2.9)]. Low social support was associated with greater prevalence of symptoms of depression [aPR 1.5 (95% CI 1.1–2.2)], anxiety [aPR 1.7 (95% CI 1.2–2.5)], and PTSD [aPR 1.6 (95% CI 1.0–2.4)]. However, social support did not meaningfully modify the relationship between HIV-related stigma and symptoms of any mental health disorders explored. Anticipated HIV-related stigma was commonly reported among this group of PWH initiating HIV care in Cameroon. Social concerns related to gossip or losing friends were of the greatest concern. Interventions focused on reducing stigma and strengthening support systems may be particularly beneficial and have the potential to improve the mental health of PWH in Cameroon.

Keywords: stigma, social support, depression, anxiety, HIV, Cameroon

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Introduction

FORTY YEARS INTO the HIV epidemic, HIV-related stigma remains a persistent public health challenge throughout sub-Saharan Africa (SSA).^{1–3} Many forms of HIV-related stigma exist and have been commonly reported among people with HIV (PWH) including anticipated, internalized, and enacted HIV-related stigma.^{4,5} Anticipated HIV-related stigma refers to the expectation that PWH will experience stigmatizing attitudes and behaviors in the future.^{6,7} Internalized HIV-related stigma refers to an individual adopting stigmatizing beliefs about PWH and directing those beliefs toward themselves.^{4,8} Enacted HIV-related stigma refers to experiencing negative behavior, treatment, or discrimination as a result of one's HIV status.^{6,7} HIV-related stigma is a substantial and chronic stressor and has been associated with poor HIV treatment outcomes, including delayed engagement in HIV care, delayed initiation of antiretroviral therapy (ART), suboptimal ART adherence, and virologic failure.^{9–13}

HIV-related stigma has also been associated with poor mental health among PWH, including greater prevalence of depression, anxiety, and suicide.^{7,14,15} Mental health disorders are highly prevalent among PWH.^{16,17} It has been estimated that 40–50% of PWH have a mental health disorder.¹⁷ Similar to HIV-related stigma, mental health disorders have been associated with poor HIV treatment outcomes throughout the HIV care continuum, including poor ART adherence, virologic failure, and all-cause mortality rate.^{18–20}

While existing research has identified a consistent relationship between HIV-related stigma and poor mental health, most of this research has occurred in high-resource settings. Less is known about the relationship between HIV-related stigma and mental health in SSA. Research into the relationship between HIV-related stigma and mental health remains particularly limited in West and Central Africa, a region that is far from meeting UNAIDS 95-95-95 goals. A systematic review focused on HIV-related stigma and mental health among PWH found that just 14 of 64 included studies were conducted in low- or middle-income countries, and just six of these studies were conducted in SSA.²¹ HIV-related stigma and its impacts may vary meaningfully across cultural, social, and geographic settings, highlighting a need for HIV-related stigma research that focuses on specific populations or settings of interest.

Social support is a potentially modifiable factor that may buffer the negative mental health sequelae of HIV-related stigma. It has been hypothesized that robust social support systems may foster resilience in the face of HIV-related stigma, reducing the negative mental health impact of such experiences.²² However, previous research into the modifying role of social support in the relationship between HIV-related stigma and mental health has found equivocal results. A study with PWH in South Africa found that social support did not modify the relationship between HIV-related stigma and depression or post-traumatic stress disorder (PTSD).²³ However, a study with PWH in Ethiopia found that social support modified the relationship between enacted HIV-related stigma and psychological distress. In this same study, though, no such modification was present when examining the relationship between anticipated or internalized HIV-related stigma and psychological distress.²⁴ Further, little is known about the extent to which the

modifying effect of social support differs across mental health disorders.

Approximately 500,000 PWH are living in Cameroon. While HIV prevalence has declined over the past decade, HIV prevalence among adults in Cameroon is 3.7%.²⁵ Less than half (45%) of PWH in Cameroon are virally suppressed.²⁵ While limited, existing research suggests that HIV-related stigma is commonly experienced by PWH in Cameroon, with one study reporting that more than half (54%) of the PWH in Cameroon surveyed experienced enacted HIV-related stigma in the past 12 months.²⁶ The most common forms of stigma experienced were verbal harassment and family members making stigmatizing remarks or gossiping.²⁶ Similarly, a qualitative study with men who have sex with men (MSM) in Cameroon found that MSM seeking HIV services commonly reported experiencing HIV-related stigma and violence.²⁷ Despite indications that HIV-related stigma remains a major public health challenge in Cameroon, the relationship among HIV-related stigma, mental health, and social support remains largely unexamined among PWH in Cameroon. This research seeks to examine the following: the prevalence of anticipated HIV-related stigma, the relationship between anticipated HIV-related stigma and symptoms of depression, anxiety, PTSD, or harmful alcohol use, and the extent to which social support from family or friends modifies the relationship between anticipated HIV-related stigma and mental health symptoms.

Greater understanding of the relationship among HIV-related stigma, social support, and mental health can inform the development of effective and culturally responsive interventions that can reduce stigma and may improve the mental health, quality of life, and HIV treatment outcomes of PWH in Cameroon and throughout SSA.

Methods

Data collection procedures have been described previously.²⁸ Overall, 426 PWH who were newly initiating HIV care were interviewed at three HIV treatment centers from June 2019 to March 2020. To be eligible for study participation, individuals had to be 21 years or older and newly enrolling in HIV care at one of the three study sites. Participants completed a structured in-person interview that included questions on mental health symptoms, substance use, HIV-related stigma, and social support. Written consent was obtained from all study participants. Study procedures were approved by the Institutional Review Board at the University of North Carolina at Chapel Hill and the National Ethics Committee of Research for Human Health in Cameroon.

Measures

Anticipated HIV-related stigma. Anticipated HIV-related stigma was assessed with 12 yes/no items, which asked participants about whether or not they were worried about experiencing specific negative outcomes because of their HIV status (e.g., *If others know or suspect that you have HIV, your family might treat you differently*). These items were created in accordance with the concept described by Earnshaw and Chaudoir.²⁹ This scale has been previously used with PWH in SSA.^{24,30} A total anticipated stigma score was created based on the proportion of endorsed items among all items that the participant was eligible to answer (i.e.,

participants without a romantic partner were not eligible to answer questions about their romantic partner) such that potential scores ranged from 0% endorsement to 100% endorsement.

Scores were then dichotomized at the median possible score to represent those with low [i.e., endorsement of less than or equal to 50% of eligible items (referent)] versus high (i.e., endorsement of more than 50% of eligible items) anticipated HIV-related stigma. Dichotomization of scale scores at the median possible score was informed by visual inspection of the relationship between continuous anticipated HIV-related stigma scale scores and mental health symptom scores.

Social support. Social support was measured with four items from the Multidimensional Scale of Perceived Social Support.³¹ Two items assessed social support from friends (i.e., *You can count on your friends when things go wrong; You have friends with whom you can share your joys and sorrows*), and two items measured social support from family (i.e., *You get the emotional help and support you need from your family; You can talk about your problems with your family*). Respondents denoted their level of agreement with each statement about support through a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

A total social support score was created by summing responses to all four items such that the total possible scale scores ranged from 4 to 20. Scores were then dichotomized at the median possible scale score to represent those with low (i.e., scores of 4–11) versus high [i.e., scores >11 (referent)] social support. Dichotomization of scale scores at the median possible score was informed by visual inspection of the relationship between continuous social support scale scores and mental health symptom scores.

Depressive symptoms. Depressive symptoms were assessed with the Patient Health Questionnaire-9 (PHQ-9) designed to assess the presence of depressive symptoms in the past 2 weeks.³² The PHQ-9 has been previously validated with PWH in Cameroon.³³ Scores of 10 or greater were categorized as moderate or severe depressive symptoms.³⁴

Anxiety symptoms. Anxiety symptoms were assessed with the Generalized Anxiety Disorder 7-item (GAD-7) designed to assess the presence of anxiety symptoms in the past 2 weeks. The GAD-7 has been previously validated in SSA.³⁵ Scores of 10 or greater were categorized as moderate or severe anxiety symptoms.³⁵

PTSD symptoms. PTSD symptoms were assessed with the PTSD Checklist for DSM-5 (PCL-5) designed to assess the presence of PTSD symptoms in the past 30 days. The PCL-5 has been previously validated in SSA.³⁶ Scores of 30 or greater were categorized as probable PTSD.³⁷

Harmful alcohol use. Harmful alcohol use was assessed with the Alcohol Use Disorders Identification Test (AUDIT).³⁸ Scores of 16 or greater were categorized as harmful alcohol use.³⁸ The AUDIT has been previously validated in SSA.³⁹

Sociodemographics. Age, gender, education, relationship status, number of children, and household hunger were assessed via self-report.

Analyses

Univariate and bivariate analyses were conducted to describe the prevalence of symptoms of depression, anxiety, PTSD, and harmful alcohol use, overall and by level of anticipated HIV-related stigma and social support. Log binomial regression analyses were used to estimate the association between high anticipated HIV-related stigma and low social support and symptoms of each mental health disorder separately. Adjusted analyses controlled for gender and clinic. Log binomial regression analyses of the relationship between high anticipated-HIV related stigma and mental health symptoms were also run stratified by level of social support (low vs. high) to examine whether social support modified the relationship between anticipated HIV-related stigma and the mental health outcomes assessed.

Missing mental health data were relatively rare ($n = 13$ for PCL-5; $n = 6$ for PHQ-9; $n = 12$ for GAD-7; $n = 2$ for AUDIT). If data were missing for less than 10% of items of the PHQ-9, GAD-7, PCL-5, or AUDIT, the mean of nonmissing scale responses for that scale was imputed for the missing items.

Results

More than half of participants were female (58.7%), partnered (58.5%), employed (64.6%), and had children (81.4%) (Table 1). Anticipated HIV-related stigma was commonly endorsed with ~80% of individuals endorsing at least 1 of 12 stigma-related concerns. The most commonly endorsed HIV-related stigma concerns were that people might start gossiping about you (57.5%), that you might cause other people to become anxious or get sick (46.0%), and that you might lose friends (38.5%) (Table 2). Approximately one-quarter of participants who reported having a romantic partner endorsed concerns related to their romantic partner (partner might leave you: 26.2%; partner might get violent: 22.2%). Similarly, approximately one-quarter of participants who had children endorsed child-related stigma concerns (your children might become upset or scared: 25.1%; your children might be abused or discriminated against: 24.3%). Approximately one-fifth (19.5%) of participants were worried that they might be told they cannot have children because they are living with HIV. The least commonly endorsed stigma-related concern was that the respondents would be kicked out of their house, with 12% endorsing this concern.

Social support from family was more commonly reported than social support from friends. Approximately 70% of participants agreed or strongly agreed that they can get the emotional help and support that they need from family (71.8%) and that they can talk about their problems with their family (69.9%) (Table 3). In comparison, only 37.0% of participants agreed or strongly agreed that they can count on their friends when things go wrong, and half (55.7%) agreed or strongly agreed that they have friends with whom they can share their joys and sorrows.

In bivariate analyses, higher levels of anticipated HIV-related stigma were associated with greater prevalence of symptoms of depression, anxiety, and PTSD. Moderate or

TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS, ANTICIPATED HIV-RELATED STIGMA, SOCIAL SUPPORT, AND MENTAL HEALTH SYMPTOMS AMONG PEOPLE WITH HIV INITIATING HIV CARE IN CAMEROON (N=426)

	Total, n (%)	Stigma		Social support	
		Low (N=331), n (%)	High (N=90), n (%)	Low (N=103), n (%)	High (N=320), n (%)
Age					
18–39	249 (58.5)	177 (53.5)	67 (74.4)	62 (60.2)	185 (57.8)
40+	177 (41.5)	154 (46.5)	23 (25.6)	41 (39.8)	135 (42.2)
Gender					
Male	176 (41.3)	136 (41.1)	37 (41.1)	37 (35.9)	139 (43.4)
Female	250 (58.7)	195 (58.9)	53 (58.9)	66 (64.1)	181 (56.6)
Highest level of formal schooling					
None	31 (7.3)	25 (7.6)	5 (5.6)	9 (8.7)	22 (6.9)
Primary	218 (51.2)	177 (53.5)	39 (43.3)	55 (53.4)	161 (50.3)
Secondary+	177 (41.5)	129 (39.0)	46 (51.1)	39 (37.9)	137 (42.8)
Relationship status					
Single	177 (41.5)	136 (41.1)	38 (42.2)	40 (38.8)	136 (42.5)
Partnered	249 (58.5)	195 (58.9)	52 (57.8)	63 (61.2)	184 (57.5)
Away >1 month in last year					
Yes	164 (38.5)	120 (36.3)	42 (46.7)	33 (32.0)	129 (40.3)
No	262 (61.5)	211 (63.7)	48 (53.3)	70 (68.0)	191 (59.7)
No. of children					
0	79 (18.6)	44 (13.3)	32 (36.0)	23 (22.3)	56 (17.6)
1+	345 (81.4)	286 (86.7)	57 (64.0)	80 (77.7)	262 (82.4)
Missing	2	1	1	0	2
Employment status					
Employed	275 (64.6)	216 (65.3)	57 (63.3)	74 (71.8)	199 (62.2)
Unemployed	151 (35.5)	115 (34.7)	33 (36.7)	29 (28.2)	121 (37.8)
Household hunger					
No/little	304 (71.9)	253 (76.9)	49 (55.1)	66 (64.7)	235 (73.9)
Moderate/severe	119 (28.1)	76 (23.1)	40 (44.9)	36 (35.3)	83 (26.1)
Missing	3	2	1	1	2
Anticipated HIV-related stigma					
Low	331 (78.6)			64 (62.1)	264 (83.8)
High	90 (21.4)			39 (37.9)	51 (16.2)
Missing	5			0	5

Cut points for low/high created using median possible scale score. Missing: stigma (N=5); social support (N=3).

TABLE 2. ENDORSEMENT OF ANTICIPATED HIV-RELATED STIGMA BY ITEM

Are you concerned that the following things may happen to you because of your HIV status?	Yes, n (%)
Fired, lose a job, or be denied a job	100 (23.5)
Kicked out of your home	51 (12.0)
Your family members might treat you differently, such as not respect your opinion	141 (33.1)
Your partner might get violent ^a	55 (22.2)
Your partner might leave you ^a	65 (26.2)
Your children might be abused or discriminated against ^b	84 (24.3)
Your children might become upset or frightful ^b	87 (25.1)
You might be told that you cannot have children	83 (19.5)
You might lose friends	164 (38.5)
People might start gossiping about you	245 (57.5)
You might cause other people to become anxious or get sick	196 (46.0)

Missing: You might be fired, lose a job, or be denied a job: N=1; your partner might get violent: N=2; your partner might leave you: N=1; your children might be abused or discriminated against: N=1; you might be told that you cannot have children: N=1.

^aNot applicable (single): N=177.

^bNot applicable (no children): N=79.

TABLE 3. ENDORSEMENT OF SOCIAL SUPPORT BY ITEM

	<i>Agree/strongly agree, n (%)</i>
You get the emotional help and support you need from your family	306 (71.8)
You can count on your friends when things go wrong	157 (37.0)
You can talk about your problems with your family	297 (69.9)
You have friends with whom you can share your joys and sorrows	236 (55.7)

Missing: you can count on your friends when things go wrong: *N*=2; you can talk about your problems with your family: *N*=1; you have friends with whom you can share your joys and sorrows: *N*=2.

severe depressive symptoms were reported by 16.9% and 32.2% of those with low and high levels of anticipated HIV-related stigma, respectively (Table 4). Similarly, moderate or severe anxiety symptoms were reported by 15.2% and 33.3% of those with low and high levels of anticipated HIV-related stigma, respectively. PTSD symptoms were reported by 12.1% and 26.7% of those with low and high levels of anticipated HIV-related stigma, respectively. In contrast, anticipated HIV-related stigma was not associated with harmful alcohol use in bivariate analyses. Harmful alcohol use was reported by 13.0% and 14.4% of those who reported low and high levels of anticipated HIV-related stigma, respectively.

In bivariate analyses, low social support was associated with greater prevalence of depression, anxiety, and PTSD. Moderate to severe depressive symptoms were reported by 25.2% and 18.4% of those with low and high social support, respectively. Moderate to severe anxiety symptoms were reported by 27.2% and 17.0% of those with low and high social support, respectively. Symptoms of probable PTSD were reported by 20.4% and 14.4% of those with low and high social support, respectively. In contrast, greater social support was associated with greater prevalence of harmful alcohol use. That is, harmful alcohol use was reported by 8.7% and 15.0% of those who reported low and high social support, respectively.

In multivariable analyses, high anticipated HIV-related stigma was associated with greater prevalence of symptoms of depression {adjusted prevalence ratio (aPR) 1.6 [95%

confidence interval (CI) 1.1–2.2]} and anxiety [aPR 2.0 (95% CI 1.4–2.9)] (Table 5). However, in multivariable analyses, high anticipated HIV-related stigma was not associated with greater prevalence of harmful alcohol use [aPR 1.2 (95% CI 0.7–2.2)] and was marginally associated with lower prevalence of probable PTSD [aPR 0.9 (95% CI 0.8–1.0)]. Low social support was associated with greater prevalence of symptoms of depression [aPR 1.5 (95% CI 1.1–2.2)], anxiety [aPR 1.7 (95% CI 1.2–2.5)], and PTSD [aPR 1.6 (95% CI 1.0–2.4)]. However, no meaningful association was observed between low social support and harmful alcohol use in multivariable analyses.

Social support did not appear to modify the relationship between anticipated HIV-related stigma and symptoms of depression, anxiety, PTSD, or harmful alcohol use. That is, high anticipated HIV-related stigma was associated with greater prevalence of depressive symptoms both among those with low social support [PR 1.9 (95% CI 1.0–3.7)] and among those with high social support [PR 1.8 (95% CI 1.1–3.1)] (Table 1). High anticipated HIV-related stigma was also associated with greater prevalence of symptoms of anxiety among those with low social support [PR 2.2 (95% CI 1.2–4.1)] and those with high social support [PR 1.9 (95% CI 1.1–3.3)]. Similar relationships with PTSD were observed among those with low social support [PR 1.8 (95% CI 0.8–3.8)] and among those with high social support [PR 2.2 (95% CI 1.2–4.0)]. Anticipated HIV-related stigma was not meaningfully associated with the prevalence of harmful alcohol use among those with low or high social support.

Discussion

In this study with PWH initiating HIV care in Cameroon, anticipated HIV-related stigma was commonly reported. High anticipated HIV-related stigma was associated with greater prevalence of symptoms of depression and anxiety. Low social support was associated with greater prevalence of symptoms of depression, anxiety, and PTSD.

Anticipated HIV-related stigma was a common concern among this group of PWH initiating HIV care in Cameroon. Participants were particularly concerned about the social consequences of HIV-related stigma, with the most commonly reported stigma-related concerns being people gossiping about them, other people becoming anxious, and losing friends because of one’s HIV status. While research on

TABLE 4. ANTICIPATED HIV-RELATED STIGMA, SOCIAL SUPPORT, AND MENTAL HEALTH SYMPTOMS AMONG PEOPLE WITH HIV INITIATING HIV CARE IN CAMEROON

	<i>Total sample</i>	<i>Depression symptoms</i>		<i>Anxiety symptoms</i>		<i>PTSD symptoms</i>		<i>Harmful alcohol use</i>	
		<i>None/low, n (%)</i>	<i>Moderate / severe, n (%)</i>	<i>None/low, n (%)</i>	<i>Moderate / severe, n (%)</i>	<i>None/low, n (%)</i>	<i>Moderate / severe, n (%)</i>	<i>No, n (%)</i>	<i>Yes, n (%)</i>
HIV-related stigma									
Low	331 (78.6)	275 (83.1)	56 (16.9)	279 (84.8)	50 (15.2)	291 (87.9)	40 (12.1)	288 (87.0)	43 (13.0)
High	90 (21.4)	61 (67.8)	29 (32.2)	60 (66.7)	30 (33.3)	66 (73.3)	24 (26.7)	77 (85.6)	13 (14.4)
Social support									
Low	103 (24.3)	77 (74.8)	26 (25.2)	75 (72.8)	28 (27.2)	82 (79.6)	21 (20.4)	94 (91.3)	9 (8.7)
High	320 (75.7)	261 (81.6)	59 (18.4)	264 (83.0)	54 (17.0)	274 (85.6)	46 (14.4)	272 (85.0)	48 (15.0)

PTSD, post-traumatic stress disorder.

TABLE 5. BIVARIATE AND MULTIVARIABLE ASSOCIATIONS BETWEEN ANTICIPATED HIV-RELATED STIGMA, SOCIAL SUPPORT, AND MENTAL HEALTH SYMPTOMS AMONG PEOPLE WITH HIV INITIATING HIV CARE IN CAMEROON

	Depressive symptoms		Anxiety symptoms		PTSD symptoms		Harmful alcohol use	
	PR (95% CI)	aPR (95% CI) ^a	PR (95% CI)	aPR (95% CI) ^a	PR (95% CI)	aPR (95% CI) ^a	PR (95% CI)	aPR (95% CI) ^a
Stigma ^b								
Low	1.00	1.00 (1.13–2.22)	1.00	1.00 (1.41–2.89)	1.00	1.00 (0.79–1.00)	1.00	1.00 (0.71–2.16)
High	1.90 (1.30–2.79)	1.58 (1.13–2.22)	2.19 (1.49–3.23)	2.02 (1.41–2.89)	2.21 (1.41–3.46)	0.89 (0.79–1.00)	1.11 (0.63–1.98)	1.24 (0.71–2.16)
Social support ^c								
Low	1.37 (0.91–2.05)	1.53 (1.08–2.18)	1.60 (1.07–2.39)	1.72 (1.19–2.48)	1.42 (0.89–2.26)	1.57 (1.03–2.41)	0.58 (0.30–1.15)	0.63 (0.33–1.22)
High	1.00	1.00 (1.08–2.18)	1.00	1.00 (1.19–2.48)	1.00	1.00 (1.03–2.41)	1.00	1.00 (0.33–1.22)

^aModels adjusted for clinic and gender.

^bStigma scores dichotomized at the median possible value: low values ≤50% endorsement; high values >50% endorsement.

^cSocial support scores dichotomized at the median possible score: low social support = scores of 4–11; high social support = scores >11. aPR, adjusted prevalence ratio; PR, prevalence ratio.

HIV-related stigma remains limited in Cameroon, our findings are consistent with a prior study with PWH in Cameroon that found that approximately half of PWH surveyed had isolated themselves from family or friends or chosen not to attend social gatherings in the past 12 months due to their HIV status.²⁶ In addition, in this same study, more than half of the PWH surveyed in Cameroon reported having experienced at least one form of HIV-related stigma or discrimination in the past 12 months, with family members gossiping about them and verbal harassment the most common forms of HIV-related stigma reported.²⁶ Similarly, a study with PWH in Buea, Cameroon, found that almost half (43%) of respondents felt ashamed of their HIV status and more than half (54%) felt that people had gossiped about them because of their HIV status.⁴⁰

Given the high prevalence of HIV-related stigma reported in this and previous studies among PWH in Cameroon, stigma-reduction interventions are needed to minimize all forms of HIV-related stigma. However, current evidence on the effectiveness of stigma-reduction interventions remains equivocal. A systematic review of interventions to reduce internalized HIV-related stigma found that interventions that included both structural- and individual-level intervention components were more effective than interventions with only individual-level intervention components.⁴¹ The effectiveness of such multilevel stigma-reduction interventions should be evaluated in Cameroon. In addition, emerging research with PWH in the United States has found that mental health symptoms moderate the effectiveness of stigma-reduction interventions, with greater stigma reduction occurring among PWH with mental health symptoms.^{42,43} Additional research is needed to assess whether a similar relationship exists among PWH in Cameroon and SSA more broadly. If so, stigma-reduction interventions may be of particular benefit for PWH with mental health symptoms. Given the relationship among social support, HIV-related stigma, and symptoms of depression and anxiety, and the high proportion of individuals endorsing familial support, stigma-reduction interventions that include family members of PWH should be developed, implemented, and evaluated. Little remains known about the effectiveness of family-level HIV stigma-reduction interventions.⁴⁴ While stigma-reduction intervention research remains limited in Cameroon, one study found that an HIV stigma-reduction intervention implemented in secondary schools in Cameroon was associated with significant reduction in HIV-related stigma, offering promise for the effectiveness for HIV stigma-reduction interventions in Cameroon.⁴⁵ The extent to which stigma-reduction interventions improve HIV treatment outcomes also warrants exploration, particularly as HIV-related stigma has been noted by PWH and community health workers in SSA as a barrier to community-based HIV care delivery and engagement.^{46–48}

High anticipated HIV-related stigma was associated with symptoms of anxiety and depression. This is consistent with previous research with PWH in South Africa, which found that HIV-related stigma was associated with depressive symptoms as well as with meta-analyses that found that HIV-related stigma was associated with symptoms of both anxiety and depression.^{2,7,21} Social support did not appear to modify the relationship between stigma and symptoms of anxiety or

TABLE 6. BIVARIATE ASSOCIATIONS BETWEEN ANTICIPATED HIV-RELATED STIGMA AND MENTAL HEALTH SYMPTOMS AMONG PEOPLE WITH HIV INITIATING HIV CARE IN CAMEROON, STRATIFIED BY LEVEL OF SOCIAL SUPPORT

	<i>Depressive symptoms</i> PR (95% CI)	<i>Anxiety symptoms</i> PR (95% CI)	<i>PTSD symptoms</i> PR (95% CI)	<i>Harmful alcohol use</i> PR (95% CI)
Low social support (<i>n</i> =103)				
Low stigma	1.00	1.00	1.00	1.00
High stigma	1.91 (0.99–3.71)	2.19 (1.16–4.12)	1.81 (0.85–3.85)	1.31 (0.38–4.60)
High social support (<i>n</i> =320)				
Low stigma	1.00	1.00	1.00	1.00
High stigma	1.84 (1.11–3.07)	1.94 (1.14–3.33)	2.24 (1.25–4.00)	1.23 (0.63–2.38)

depression. Prior research into the relationship among HIV-related stigma, social support, and mental health is equivocal. A meta-analysis of studies conducted with PWH in South Africa found that social support did not modify the relationship between HIV-related stigma and depressive symptoms.⁷ However, a study with adolescents with HIV found that social support as well as participation in a support group modified the relationship between HIV-related stigma and depression.⁴⁹ Similarly, a study with pregnant women with HIV in South Africa found that social support moderated the relationship between HIV-related stigma and depression.⁵⁰

Evidence suggests that interventions to strengthen social support systems may improve the mental health of PWH. For example, in Uganda, a group support psychotherapy intervention yielded significant improvements in depressive symptomatology among PWH.⁵¹ Similar findings have been observed in other resource-constrained settings.²² In addition, an HIV stigma-reduction intervention with women living with HIV found that increased social support was associated with subsequent reduction in HIV-related stigma.⁵² Interventions that include elements to bolster social support may be similarly effective among PWH in Cameroon, particularly as a study with PWH in Buea, Cameroon, found that only 7% of respondents reported belonging to a support group.⁴⁰ Future research to investigate the extent to which social support interventions may buffer the negative mental health sequelae of HIV-related stigma is needed among PWH in Cameroon and throughout SSA. Such research should use robust measures of social support.

Low social support was associated with greater prevalence of PTSD symptoms in multivariable analyses, but did not appear to modify the relationship between anticipated HIV-related stigma and PTSD symptoms. Research into the relationship among HIV-related stigma, social support, and symptoms of PTSD remains limited. However, similar to current findings, a study with PWH in South Africa found that social support was associated with symptoms of PTSD but did not moderate the relationship between HIV-related stigma and symptoms of PTSD.²³ Greater understanding of the relationships among social support, HIV-related stigma, and PTSD among PWH is warranted.

Neither stigma nor social support was associated with harmful alcohol use. This is consistent with a meta-analysis that found that severity of alcohol use was not associated with HIV-related stigma.² Similarly, previous studies with PWH in SSA and the United States found that social support was not associated with hazardous alcohol use.^{53,54}

This study has several limitations worth noting. Data were collected from PWH at three HIV treatment facilities in

Cameroon, limiting generalizability to other settings and populations. In addition, data were collected from PWH at initiation into HIV care. The relationships among HIV-related stigma, social support, and mental health symptoms may differ at other points throughout the HIV care continuum. The anticipated stigma scale used in this study has not been formally validated, and only a subset of questions from the social support measure was used. Further, data are cross-sectional and do not shed light on longitudinal relationships among HIV-related stigma, social support, and mental health symptoms.

Anticipated HIV-related stigma was commonly reported among this group of PWH initiating HIV care in Cameroon. Social concerns related to gossip or losing friends were of the greatest concern. High levels of anticipated-related stigma were associated with greater prevalence of symptoms of depression and anxiety, and low social support was associated with greater prevalence of symptoms of anxiety, depression, and PTSD. Interventions focused on reducing stigma and strengthening support systems may be particularly beneficial and have the potential to improve the mental health of PWH in Cameroon.

Authors' Contributions

A.M.P.: Funding; conceptualization; and writing—original draft. L.M.F. and A.G.: Analysis and writing—review and editing. P.V.E. and E.P.-Y.: Project administration and writing—review and editing. A.D.: Project administration; supervision; and writing—review and editing. B.W.P., M.W., and D. Nash: Conceptualization and writing—review and editing. M.Y., K.A., D. Nsame, and R.A.: Writing—review and editing. All the authors have approved the final article.

Author Disclosure Statement

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