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HIV Stigma Among Substance Abusing People Living with HIV/AIDS: Implications for HIV Treatment

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HIV Stigma Among Substance Abusing People Living with HIV/AIDS: Implications for HIV Treatment

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Abstract

HIV-related stigma has a major impact on quality of life and health among people living with HIV and AIDS (PLWHA). This study examines demographic, mental health, behavioral, contextual, and HIV care-related correlates of HIV stigma among 503 substance abusing PLWHA. Stigma was measured with the HIV Internalized Stigma Measure which has four subscales: stereotypes about HIV, self-acceptance, disclosure concerns, and social relationships. Severe substance dependence (55.3%) and depression (54.7%) were associated with higher HIV stigma across all domains. 49.9% of the sample reported antiretroviral (ARV) medication diversion (the unlawful sale and trading of ARV medications); diverters endorsed significantly higher stigma related to disclosure. 54.1% of the sample reported ≥95% ARV adherence; these individuals reported significantly lower stigma for self-acceptance, disclosure, and social relationships. Multivariate linear regression showed that depression and social support demonstrated significant main effects across stigma domains. Findings suggest that interventions to decrease HIV related stigma may be an important component of initiatives to increase engagement in HIV care.

Introduction

STIGMA IS A COMPLEX SOCIAL PROCESS encompassing the co-occurrence of labeling, stereotyping, separation, status loss, and discrimination.[1] Research has indicated that stigma has a major impact on quality of life and overall health outcomes among people living with HIV/AIDS (PLWHA).[2,3] HIV-related stigma is often experienced as social rejection, disapproval, and discrimination, which heightens shame and fear of disclosure. Concealment of HIV+ status can lead to decreased social support, depression, inability to work, financial strain, and the decision to forgo valuable medical treatment.[4–7] Higher levels of HIV-related stigma are associated with: decreased antiretroviral medication adherence and uptake of medical care; increased mental distress including depression, anxiety, and hopelessness; and HIV-related symptoms,[2,6,8–12] making it difficult for PLWHA to receive the optimal benefits of HIV care and treatment.[13]

HIV-related stigma has been described as encompassing specific domains including internalized stigma (negative feelings and beliefs associated with HIV and applied to the self), enacted stigma (actual experiences of discrimination, stereotyping, and/or prejudice from others due to one's HIV), and anticipated stigma (expectations of discrimination, stereotyping and/or prejudice from others in the future due to one's HIV);[14] each of these has been associated with harms to

health and well-being, including under-utilization of HIV-related medical care.[15] In particular, internalized HIV stigma has been linked to numerous adverse health and social consequences for PLWHA including poor mental and physical health status, as well as decreased social support, social integration and overall quality of life.[11–13,16,17]

Internalized HIV stigma incorporates four dimensions: confronting blame and stereotypes of HIV; managing disclosure of a stigmatized status; renegotiating social relationships; and self-acceptance, or level of personal comfort with one's HIV diagnosis.[2,16] Despite the potential significance of stigma in the lives of many PLWHA, much of the research in this area has been concentrated among injection drug users and men who have sex with men, with some limited attention to ethnic community, gender, or age-related analyses.[13,18–20] Little is known about how HIV stigma may impact other understudied PLWHA, particularly those with intersecting stigmas, including the indigent, non-IDU substance abusers, and PLWHA with high levels of competing needs. Numerous studies have described HIV-related stigma as multi-layered, encompassing stigma related to HIV, as well as stigma based on a marginalized group status such as age, race, socioeconomic status, or sexual orientation, and other individualized factors including substance abuse.[2,13,18] The presence of multiple stigmas among highly vulnerable PLWHA may be associated with an even greater magnitude of effect on health-seeking behaviors, but

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this has not been well examined in prior research. The purpose of this article is to examine the demographic, mental health, behavioral, contextual, and HIV care-related correlates of specific internalized HIV stigma domains among a sample of socioeconomically disadvantaged substance abusing PLWHA, in order to identify potential intervention targets to increase uptake of care and ARV adherence. The present study was guided by Andersen's Behavioral Model for Vulnerable Populations, a conceptual model used to explore how predisposing, enabling, and need factors predict personal health practices and their relation to physical health and satisfaction with care outcomes.[21] For the purpose of this article, we sought to examine the predisposing factors of HIV-related stigma among a vulnerable, indigent sample of PLWHA[10] in an effort to understand how these they may influence HIV-related health behaviors and care utilization.

Methods

Target population and study eligibility

The data were drawn from a mixed methods study designed to examine the patterns and predictors of ARV diversion (the unlawful sale and trading of ARV medications) among indigent HIV-positive substance abusing individuals living within South Florida. Eligible participants were those who: could provide documentation of their HIV status and were currently prescribed ARV medications; were age 18 or older; and reported cocaine, crack, or heroin use 12 or more times in the past 90 days. The additional criterion of diverter was satisfied by endorsement of ARV medication diversion at least once in the past 90 days. We sought to enroll equal numbers of users diverting their personal ARV medications ($n=251$) and those who were not ($n=252$).

Study recruitment

In an effort to recruit this hard-to-reach population, we used targeted sampling strategies, a purposeful, systematic sampling method by which specified populations within geographical districts are identified, and plans are constructed to recruit specified numbers of individuals within each of the target areas.[22] Using existing data from the Miami Dade County Department of Health and the US Census Bureau, we identified communities most impacted by intersecting poverty and high HIV prevalence, specifically geographically clustered concentrated poverty areas to the north of downtown.[23–27]

Primary recruitment was done through direct outreach and was conducted through the distribution of study cards and flyers in street venues and HIV service locations. Professional outreach workers, indigenous to the target recruitment areas, and several members of the team had prior experience conducting outreach for local community service agencies. Outreach teams recruited from different sections the target areas on an at least weekly basis over the 3-year study recruitment period. Key informants such as street drug users, and community outreach workers were also utilized in an effort to locate less visible ARV diversion street market locations (e.g., small pharmacies or other local hangouts) within the target areas.

Study procedures

Eligible participants were scheduled for appointments at the project office following a brief telephone screening. 2112 individuals were screened, 599 met study eligibility criteria, and 503 were enrolled into the study. The primary reason for non-enrollment (84%) was repeated lack of attendance to the scheduled interview. Upon arrival, participants were re-screened, informed consent was obtained, and the trained study staff conducted computer-assisted personal interviews (CAPI). This interview typically lasted 1 h and clients were paid a $30 stipend upon completion; each client was also offered a variety of educational and risk reduction materials. All project staff completed the requirements for National Institutes of Health (NIH) web-based certification for protection of human subjects and a Certificate of Confidentiality from the National Institutes of Health (NIH) was also obtained. Study protocols were approved by the University of Delaware's (predecessor institution) and Nova Southeastern University's Institutional Review Boards.

Data collection and measures

Depending upon preference, interviews were offered to respondents in both English and Spanish. The Global Appraisal of Individual Needs (GAIN, v. 5.4)[28] was the primary data collection instrument for the survey study. Psychometric studies have found Cronbach's alphas between 0.9 and 0.8, and behavior questions have demonstrated test-retest correlations over 0.8.[29] The GAIN has eight core sections encompassing: demographics; mental health status, including DSM-IV depression, anxiety measures, and substance use and DSM-IV dependence; HIV risk behaviors; and environmental, legal, and vocational measures. Other standardized instruments were also used to measure HIV diagnosis/treatment history,[30] ARV adherence,[31] attitudes toward HIV providers,[32] and ARV medications, health literacy and HIV knowledge, and HIV treatment satisfaction and access.[33] A new instrument was also developed to assess ARV medication diversion.

Demographic information including age, race, gender, level of education, and monthly income were collected. HIV stigma, the main outcome variable for this analysis, was assessed through a modified version of the HIV Internalized Stigma Measure,[16] which contained 11 items; this was an adaptation of the original scale based on item appropriateness for the target population and elimination of duplicative items from other measures. Overall and stigma scores were calculated as a sum of these 11 items; scores ranging from 11 to 44, with higher scores reflecting greater levels of stigma. Our adapted measure included all four subscales: stereotypes about HIV (three items, scores range from 3 to 12; $\alpha=0.720$), self-acceptance (three items, scores range from 3 to 12, $\alpha=0.688$), disclosure concerns (two items scores range from 2 to 8; $\alpha=0.718$), and social relationships (three items, scores range from 3 to 12; $\alpha=0.828$). Participants were retained on the subscales where they had complete data, and those with missing values were not included.

Mental health factors. These were collected from the GAIN's mental health subscales (based on DSM-IVR criteria): the depressive symptom scale assesses past 12 month occurrence of nine depressive symptoms (e.g., feeling sad, lonely, or hopeless; feeling tired or having no energy) and is scored as none/minimal (0–1), moderate (2–5), or severe (6–9); and past year substance dependence, encompassing questions related to past year drug problem severity (e.g., using more or longer than intended, withdrawal problems) was measured through seven items, with endorsement of six or more

TABLE 1. INTERNALIZED STIGMA MEAN SCORES BY DESCRIPTIVE SAMPLE CHARACTERISTICS N=503

Demographic factors	N (%)	Overall scale (mean, SD) range: 11–44	Stereotypes[a]	Self-acceptance[b]	Disclosure concerns	Social relationships[b]
Age (mean, SD)	46.07 (7.77)					
46 and below	252 (50.1)	24.18 (7.47)	7.84	7.19	4.03	5.24
47 and up	251 (49.9)	23.55 (7.84)	7.81	6.99	3.79	5.04
Gender						
Male	299 (59.4)	23.84 (7.46)	7.79	7.17	3.82	5.19
Female	204 (40.6)	23.91 (7.95)	7.88	6.98	4.03	5.07
Education						
High school or more	219 (43.5)	24.37 (7.77)	8.01	7.08	4.03	5.34
Less than high school	284 (56.5)	23.48 (7.55)	7.68	7.10	3.81	4.99
Monthly income						
Over $1000	93 (18.9)	23.72 (7.76)	7.83	6.85	3.82	5.34
≤$1000	408 (81.1)	23.92 (7.65)	7.82	7.16	3.93	5.10
Race						
African American	340 (67.6)	23.34 (7.69)*	7.61*	7.03	3.87	4.96*
All other races	163 (32.4)	24.96 (7.47)*	8.26*	7.22	3.99	5.51*
Mental health factors						
Severe depression						
Yes	275 (54.7)	26.21 (7.69)**	8.40**	7.57**	4.43**	5.91**
No	228 (45.3)	21.04 (6.59)**	7.12**	6.52**	3.28**	4.21**
Severe substance dependence						
Yes	278 (55.3)	25.58 (7.64)**	8.24**	7.75**	4.19**	5.56**
No	225 (44.7)	21.76 (7.14)**	7.31**	6.34**	3.56**	4.62**
Behavioral factors						
Recent ARV diversion						
Yes	251 (49.9)	24.62 (7.71)*	8.06	7.26	4.09*	5.33
No	252 (50.1)	23.12 (7.53)*	7.60	6.92	3.73*	4.95
95% ARV adherence						
Yes	272 (54.1)	23.20 (7.23)*	7.80	6.82*	3.74*	4.93*
No	231 (45.9)	24.66 (8.07)*	7.86	7.42*	4.10*	5.39*

(continued)

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TABLE 1. (CONTINUED)

Demographic factors	N (%)	Overall scale (mean, SD) range: 11–44	Stereotypes[a]	Self-acceptance[b]	Disclosure concerns	Social relationships[b]
Contextual factors						
Recent (past 90) homelessness						
Yes	197 (39.2)	25.89 (7.75)**	8.55***	7.54*	4.22*	5.75***
No	306 (60.8)	22.57 (7.32)***	7.37***	6.81*	3.71*	4.76***
Years HIV diagnosis[c] (mean, SD)	12.94 (7.31)					
12 years or less	241 (47.9)	24.33 (7.54)	7.97	7.42**	4.11*	4.98
13 years or more	259 (51.5)	23.41 (7.78)	7.68	6.78**	3.73*	5.27
Length of time on ARVs[c] (mean, SD)	9.77 (6.6)					
9 years or less	245 (49.0)	24.58 (7.53)	7.80	7.48*	4.22**	4.99
10 years or more	255 (51.0)	23.27 (7.72)	7.66	6.77*	3.64**	5.30
General social support (mean, SD), range: 3–15	10.14 (3.25)					
Low (9 and under)	257 (51.1)	26.42 (7.53)**	8.54***	7.77**	4.27**	6.02**
High (10 and above)	246 (48.9)	21.20 (6.84)***	7.09***	6.39***	3.53**	4.24***
Care-related factors						
Attitude toward HIV providers (mean, SD), range: 12–48	43.80 (5.34)					
Less favorable (45 and below)	238 (47.3)	25.98 (7.75)**	8.24**	7.60**	4.35**	5.93**
Favorable (46 and above)	265 (52.7)	21.97 (7.06)**	7.44**	6.64**	3.51**	4.44**
ARV medication attitudes[d] (mean, SD), range: 1–10	8.45 (1.92)					
Negative (8 and below)	238 (47.3)	26.22 (7.75)**	8.28**	7.78**	4.37**	5.89**
Positive (9 and above)	264 (52.5)	21.69 (6.88)**	7.41**	6.44**	3.49**	4.45**
HIV treatment access[b] (mean, SD), range: 9–28	23.79 (4.31)					
Less access (24 and below)	235 (46.7)	26.52 (7.10)**	8.41**	7.83**	4.51**	5.86**
More access (25 and above)	268 (53.3)	21.55 (7.41)**	7.30**	6.44**	3.38**	4.52**

[a]N=494; [b]N=492; [c]N=500; [d]N=502.
*$p<0.05$; **$p<0.01$.

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showing severe dependence. Alpha reliability coefficients for these scales are as follows: depression ($\alpha = 0.77$) and substance dependence ($\alpha = 0.83$).[28]

Behavioral factors. To assess ARV diversion, participants were asked: ''When was the last time, if ever, that you sold or traded any of your HIV medications to another person for any reason?'' This variable was dichotomized into ''within the past 3 months'' or ''more than 3 months ago.'' Medication adherence was assessed via the ACTG Questionnaire.[31] The ARV section gathered total ARV doses prescribed and total doses in the past 7 days. Using these data, weekly ARV doses taken were computed and divided by total doses prescribed to generate an adherence percentile score.

Contextual factors. As suggested by Earnshaw and Kalichman,[13] there are unique interpersonal drivers of HIV stigma within the sociocultural context of each individual. In this regard, individual contextual factors of our participants encompassed aspects related to housing, length of time since HIV diagnosis, and levels of social support. Recent homelessness was also assessed through the question, ''When was the last time you considered yourself to be homeless?'' This variable was dichotomized for analysis into ''within the past 3 months'' or ''more than 3 months ago.''

Participant response (month and year) were recorded when asked ''When were you first diagnosed with HIV infection?'' and a variable was created to calculate the number of years with HIV by subtracting the year of diagnosis from the interview year. Length of time on ARVs was assessed in a similar way; participant response (month and year) were recorded for the question ''When were you first prescribed to take any HIV medications?'' Subsequently, a variable was created to calculate the number of years on ARVs by subtracting the year of first ARV prescription from the interview year. This measure provides an estimate of time on ARVs, but we were unable to assess whether ARV medication use was continuous during the documented time period.

General social support was assessed via the following three items adapted from the HIV Health Care Cost and Services Utilization Study:[34] Someone to give you money if you really need it; someone to help with chores, errands, or appointments if you were sick; and someone to love you and make you feel wanted; it is scored on a 1–5 scale (none of the time–all of the time), with higher scores indicating more support. The alpha reliability coefficient for our sample was $\alpha = 0.76$.

HIV care-related factors. Care related factors were measured via standardized scales. Patient attitudes toward HIV providers in terms of professionalism and emotional support were calculated through a revised version of the Attitudes Toward HIV Health Care Providers Scale,[32] a 12-item instrument with answer choices ranging from 1 to 4 (strongly disagree–strongly agree); scores range from 12 to 48 and higher scores reflect more perceived support. The alpha reliability coefficient for measure among our sample was $\alpha = 0.87$. The revised Antiretroviral Medication Attitude Scale (AMAS) is a 15-item instrument (true/false response choices) used to assess four dimensions of attitudes regarding ARV medications: improvement, negative reminders of illness, flexibility and control over medications, and the ability of ARV's to prevent negative health consequences; the scale

has high internal consistency with a published Cronbach's alpha of 0.84;[35] for our adapted version of this measure, the alpha reliability coefficient $\alpha = 0.57$.

HIV treatment access was calculated via the general access to care questions from the HIV Health Care Cost and Services Utilization Study,[33] which includes seven items such as ''Places where I can get medical care are very conveniently located'' and ''I have easy access to the medical specialists I need.'' Responses were combined to calculate a treatment access score; scores are on a 1–4 scale (strongly agree to strongly disagree) and range from 7 to 28, with higher scores indicating more ease in accessing treatment. Alpha reliability coefficient for this scale among our sample was $\alpha = 0.81$.

Statistical analysis

Data were analyzed using IBM SPSS Statistics, version 21[36]. Descriptive statistics were calculated to describe the sample in terms of: demographics; mental health, including depression and substance dependence; behavioral factors, including recent (past 90 day) ARV diversion and adherence; contextual factors, including number of years with a diagnosis of HIV, length of time taking ARVs, and social support; and HIV care factors, including attitudes toward providers and ARV medications and treatment access. Mean overall stigma scale scores and mean subscale scores (stereotypes about HIV, self-acceptance, disclosure concerns, and social relationships) were examined for each variable of interest. For the purpose of means testing, continuous variables, including number of years with a diagnosis of HIV, social support, attitudes toward providers and ARV medications, and treatment access, were dichotomized using a median split. T-tests were utilized to examine differences in demographic (age, gender, race, education), mental health (depression and substance dependence), behavioral factors (recent ARV diversion and adherence), contextual factors (time since HIV diagnosis and social support), and HIV care factors (attitudes toward providers and ARV medications and HIV treatment access) by each stigma subscale. Significance level was set at $p < 0.05$ for all comparisons.

Four multivariate linear regression models were then constructed to examine the associations between the significant independent variables (demographic, mental health, behavioral, contextual, and HIV care factors) and each stigma subscale score. For the regression analyses, internalized stigma subscales were the outcomes of interest, with each treated as a continuous variable; all independent variables (race, depression, substance dependence, ARV diversion and adherence, and homelessness, time since HIV diagnosis, length of time taking ARVs, social support, treatment access, attitude toward HIV providers, and ARV medications) in the models were treated as dichotomous variables using the median cutpoints from the bivariate analyses. Multicollinearity analyses were conducted for the independent variables of interest and no evidence of multicollinearity was found after examining the variance inflation factor (VIF < 3). Variables were entered simultaneously into the linear regression model.

Results

Sample characteristics are displayed in Table 1. The mean age of the sample was 46.07 (SD 7.77; range 19–71) and more than half of the respondents were male (59.4%). The sample was predominantly African American (67.6%), with

TABLE 2. MULTIVARIATE LINEAR REGRESSION MODEL PREDICTING STIGMA RELATED
TO STEREOTYPES AMONG HIV+ SUBSTANCE ABUSERS IN SOUTH FLORIDA, N=494

	Unstandardized B (SE)	Standardized β	95% CI	p Value
African American[a]	−0.29	−0.05	−0.78, 0.20	0.24
Severe depression[a]	0.62	0.12	0.011, 1.12	0.02
Severe substance dependence[a]	0.37	0.07	−0.12, 0.86	0.14
Recent ARV diversion[a]	0.14	0.03	−0.34, 0.62	0.57
95% ARV adherence[a]	0.28	0.05	−0.19, 0.75	0.25
Recent (past 90 day) homelessness[a]	0.68	0.12	0.19, 1.16	0.01
Diagnosed with HIV 13 years or more ago[b]	−0.16	−0.03	−0.71, 0.39	0.56
Taking ARVs 10 years or more[c]	−0.09	−0.02	−0.65, 0.47	0.75
Higher social support[d]	−0.98	−0.18	−1.45, −0.51	0.00
Favorable attitude toward HIV providers[e]	−0.16	−0.03	−0.65, 0.33	0.53
Positive ARV medication attitudes[f]	−0.32	−0.06	−0.79, 0.16	0.19
More treatment access[g]	−0.46	−0.09	−0.95, 0.04	0.07

[a]Reference category is 'no'; [b]Reference category is 'diagnosed 12 or less years ago'; [c]Reference category is 'taking ARV's 9 years or less'; [d]Reference category is 'lower social support'; [e]Reference category is 'less favorable attitude toward HIV providers'; [f]Reference category is 'negative ARV medication attitudes'; [g]Reference category is 'less treatment access'.

over half having less than a high school education (56.5%). The majority of participants (81.1%) had a monthly income of under $1000 and many reported elevated rates of mental health problems.

Bivariate results

The overall mean stigma score for the sample was 23.87 (SD 7.65). In terms of race, as compared to African Americans, all other races (predominately white and Hispanic) experienced significantly higher stigma overall and specifically related to stereotypes (8.26 vs. 7.61, $p < 0.05$) and social relationships (5.51 vs. 4.96, $p < 0.05$).

As indicated in Table I, subscale stigma scores were significantly associated with several mental health, behavioral, contextual, and HIV care-related factors. When examining mental health factors, those with severe depression (54.7%) reported significantly higher mean stigma scores overall compared to those without severe depression and specifically related to stereotypes (8.40 vs. 7.12, $p < 0.01$), self-acceptance (7.57 vs. 6.52, $p < 0.01$) disclosure (4.43 vs. 3.28, $p < 0.01$),

and social relationships (5.91 vs. 4.21, $p < 0.01$). Participants reporting severe substance dependence (55.3%) also endorsed higher mean HIV stigma scores overall and related to stereotypes (8.24 vs. 7.31, $p < 0.01$), self-acceptance (7.71 vs. 6.34, $p < 0.01$), disclosure (4.19 vs. 3.56, $p < 0.01$), and social relationships (5.56 vs. 4.62, $p < 0.01$) compared with the non-dependent.

Behavioral factors were also significantly associated with HIV-related stigma. Nearly 50% of the sample reported recent ARV diversion, with diverters endorsing significantly higher stigma overall and related to disclosure (4.09 vs. 3.73, $p < 0.05$) compared with non-diverters; 54.1% of the sample reported 95% ARV adherence, with these individuals reporting significantly lower stigma overall and in relation to self-acceptance (6.82 for adherent vs. 7.42 for nonadherent, $p < 0.05$), disclosure (3.74 vs. 4.10, $p < 0.05$), and social relationships (4.93 vs. 5.39, $p < 0.05$) when compared to those with less than 95% adherence.

In terms of contextual factors, participants reporting recent homelessness had higher stigma overall and related to stereotypes (8.55 vs. 7.36, $p < 0.01$), self acceptance (7.54 vs.

TABLE 3. MULTIVARIATE LINEAR REGRESSION MODEL PREDICTING STIGMA RELATED TO DISCLOSURE
CONCERNS AMONG HIV+ SUBSTANCE ABUSERS IN SOUTH FLORIDA, N=503

	Unstandardized B (SE)	Standardized β	95% CI	p Value
African American[a]	0.26	0.06	−0.11, 0.62	0.17
Severe depression[a]	0.75	0.18	0.37, 1.12	0.00
Severe substance dependence[a]	0.19	0.05	−0.18, 0.55	0.31
Recent ARV diversion[a]	−0.01	−0.00	−0.37, 0.35	0.95
95% ARV adherence[a]	−0.14	−0.04	−0.50, 0.21	0.43
Recent (past 90 day) homelessness[a]	−0.02	−0.00	−0.38, 0.35	0.43
Diagnosed with HIV 13 years or more ago[b]	−0.10	−0.02	−0.51, 0.32	0.64
Taking ARVs 10 years or more[c]	−0.37	−0.09	−0.78, 0.05	0.09
Higher social support[d]	−0.37	−0.09	−0.72, −0.02	0.04
Favorable attitude toward HIV providers[e]	−0.38	−0.09	−0.75, −0.01	0.05
Positive ARV medication attitudes[f]	−0.39	−0.10	−0.74, −0.03	0.03
More treatment access[g]	−0.67	−0.16	−1.04, −0.29	0.00

[a]Reference category is 'no'; [b]Reference category is 'diagnosed 12 or less years ago'; [c]Reference category is 'taking ARV's 9 years or less'; [d]Reference category is 'lower social support'; [e]Reference category is 'less favorable attitude toward HIV providers'; [f]Reference category is 'negative ARV medication attitudes'; [g]Reference category is 'less treatment access'.

TABLE 4. MULTIVARIATE LINEAR REGRESSION MODEL PREDICTING STIGMA RELATED
TO SELF-ACCEPTANCE AMONG HIV+ SUBSTANCE ABUSERS IN SOUTH FLORIDA, N=492

	Unstandardized B (SE)	Standardized β	95% CI	p Value
African American[a]	0.23	0.04	−0.32, 0.76	0.42
Severe depression[a]	0.09	0.01	−0.47, 0.64	0.76
Severe substance dependence[a]	1.02	0.17	0.48, 1.56	0.00
Recent ARV diversion[a]	−0.24	−0.04	−0.77, 0.29	0.38
95% ARV adherence[a]	−0.37	−0.06	−0.89, 0.16	0.17
Recent (past 90 day) homelessness[a]	−0.04	−0.01	−0.58, 0.49	0.87
Diagnosed with HIV more than 13 years or more ago[b]	−0.30	−0.05	−0.90, 0.31	0.34
Taking ARVs 10 years or more[c]	−0.39	−0.07	−1.00, 0.23	0.22
Higher social support[d]	−0.89	−0.15	−1.41, −0.37	0.00
Favorable attitude toward HIV providers[e]	−0.28	−0.05	−0.82, 0.27	0.32
Positive ARV medication attitudes[f]	−0.80	−0.14	−1.33, −0.28	0.00
More treatment access[g]	−0.81	−0.14	−1.35, −0.26	0.00

[a]Reference category is 'no'; [b]Reference category is 'diagnosed 12 or less years ago'; [c]Reference category is 'taking ARV's 9 years or less'; [d]Reference category is 'lower social support'; [e]Reference category is 'less favorable attitude toward HIV providers'; [f]Reference category is 'negative ARV medication attitudes'; [g]Reference category is 'less treatment access'.

6.81, $p < 0.05$), disclosure (4.22 vs. 3.71, $p < 0.05$), and social relationships (5.75 vs. 4.76, $p < 0.01$) than the non-homeless. The mean number of years since HIV diagnosis was 12.94 (SD 5.34). Those with an HIV diagnosis for 13 years or more had lower self-acceptance stigma (6.78 vs. 7.42, $p < 0.01$) and disclosure stigma (3.73 vs. 4.11, $p < 0.01$). In terms of length of time prescribed ARVs, the mean for the sample was 9.77 (SD 6.6), and taking ARVs for 10 years or more had significantly lower stigma related to self-acceptance (6.77 vs. 7.48, $p < 0.05$) and disclosure concerns (4.22 vs. 3.64, $p < 0.01$). Social support (mean 10.14, SD 3.25) was also related to HIV stigma; higher social support indicated lower stigma for all stigma subscales.

HIV care related factors were also associated with stigma. More favorable attitudes toward HIV care providers were correlated with lower stigma overall and for stereotypes (7.44 vs. 8.24, $p < 0.01$), self-acceptance (6.64 vs. 7.60, $p < 0.01$), disclosure (3.51 vs. 4.35, $p < 0.01$), and social relationships (4.44 vs. 5.93, $p < 0.01$). Similarly, participants with positive attitudes toward ARV medications had decreased stigma overall and related to stereotypes (7.41 vs. 8.28, $p < 0.01$), self-acceptance

(6.44 vs. 7.78, $p < 0.01$), disclosure (3.49 vs. 4.37, $p < 0.01$), and social relationships (4.45 vs. 5.89, $p < 0.01$). More access to treatment was associated with decreased stigma overall and related to stereotypes (7.30 vs. 8.41, $p < 0.01$), self-acceptance (6.44 vs. 7.83, $p < 0.01$), disclosure (3.38 vs. 4.50, $p < 0.01$), and social relationships (4.52 vs. 5.86, $p < 0.01$).

Multivariate results

Tables 2 through 5 show the results of each multivariate linear regression model examining the associations of race, depression, substance dependence, ARV diversion and adherence, recent homelessness, time since HIV diagnosis, length of time taking ARVs, social support, attitudes toward ARV medications and treatment providers, and treatment access with each stigma domain. Depression, recent homelessness, and higher social support demonstrated significant main effects on *stigma related to stereotypes*: depression was associated with higher stigma ($\beta = 0.62$, $p = 0.02$); recent homelessness was also associated with increased stigma ($\beta = 0.68$, $p = 0.01$), whereas higher social support yielded

TABLE 5. MULTIVARIATE LINEAR REGRESSION MODEL PREDICTING STIGMA RELATED TO SOCIAL
RELATIONSHIPS AMONG HIV+ SUBSTANCE ABUSERS IN SOUTH FLORIDA, N=492

	Unstandardized B (SE)	Standardized β	95% CI	p Value
African American[a]	−0.07	−0.01	−0.51, 0.37	0.77
Severe depression[a]	1.02	0.20	0.56, 1.47	0.00
Severe substance dependence[a]	0.21	0.04	−0.23, 0.65	0.35
Recent ARV diversion[a]	−0.17	−0.03	−0.60, 0.26	0.43
95% ARV adherence[a]	−0.23	−0.04	−0.64, 0.21	0.31
Recent (past 90 day) homelessness[a]	0.34	0.06	−0.10, 0.77	0.13
Diagnosed with HIV 13 years or more ago[b]	0.08	0.02	−0.42, 0.57	0.76
Taking ARVs 10 years or more[c]	0.49	0.09	−0.02, 0.99	0.06
Higher social support[d]	−1.12	−0.22	−1.54, −0.70	0.00
Favorable attitude toward HIV providers[e]	−0.75	−0.15	−1.19, −0.31	0.00
Positive ARV medication attitudes[f]	−0.85	−0.17	−1.27, −0.43	0.00
More treatment access[g]	−0.41	−0.08	−0.86, 0.03	0.07

[a]Reference category is 'no'; [b]Reference category is 'diagnosed 12 or less years ago'; [c]Reference category is 'taking ARV's 9 years or less'; [d]Reference category is 'lower social support'; [e]Reference category is 'less favorable attitude toward HIV providers'; [f]Reference category is 'negative ARV medication attitudes'; [g]Reference category is 'less treatment access'.

lower stigma ($\beta = -0.98$, $p = 0.00$). This regression model had an adjusted R square of 0.13.

Depression was associated with significantly higher *disclosure stigma* ($\beta = 0.75$, $p = 0.00$); significant associations showing lower stigma related to disclosure concerns included more favorable attitudes toward HIV providers ($\beta = -0.38$, $p = 0.05$), ARV medications ($\beta = -0.39$, $p = 0.03$), and better treatment access ($\beta = -0.67$, $p = 0.00$). This regression model had an adjusted R square of 0.153.

In terms of *self-acceptance stigma*, substance dependence was associated with significantly higher levels of stigma ($\beta = 1.02$, $p = 0.00$); lower levels of stigma were associated with higher social support ($\beta = -0.89$, $p = 0.00$), more positive ARV medication attitudes ($\beta = -0.80$, $p = 0.00$), and better treatment access ($\beta = -0.81$, $p = 0.00$). The adjusted R square of this regression model was 0.139.

Depression was associated with higher *stigma related to social relationships* ($\beta = 1.02$, $p = 0.00$) and lower levels of stigma were linked to higher social support ($\beta = -1.12$, $p = 0.00$), more favorable attitudes toward HIV providers ($\beta = -0.75$, $p = 0.00$), and ARV medications ($\beta = -0.85$, $p = 0.00$). The adjusted R square for this model was 0.26.

Discussion

This study reports novel and significant findings on demographic, mental health, behavioral, contextual, and care-related factors associated with internalized HIV stigma among a sample of indigent substance using seropositive individuals in South Florida. Our data highlight the fact that mental health problems, including severe depression, were associated with higher stigma related to stereotypes, disclosure, and social relationships, indicating that individuals with psychological distress may be less willing to obtain and take their ARV medications due to fears related to disclosing their status. This would appear to constitute a significant risk factor for attending and remaining engaged in regular HIV care. Similar to some prior research,[37] substance dependence symptoms for our sample were tied to significantly higher stigma overall and related to self-acceptance; these findings are contrary to some studies which have found lower levels of HIV stigma among substance abusers.[19]

Sayles and colleagues[2] indicated that stereotypes related to HIV often encompass feelings of blame for the infection based on how it was acquired, and suggest that these feelings are made more intense due to individuals self judgments and feelings of shame around being HIV positive; blame for HIV infection was also found to be further intensified by other factors associated with marginalization, including race and gender.[2] Contrary to these findings, we did not find significant differences in HIV related stigma based on gender.[7,19] Moreover, despite previous research indicating that African Americans experience higher levels of HIV related stigma,[19] we found significantly higher stigma for other races as compared to African Americans. We speculate that this finding may reflect the disproportionately high rates of infection that have impacted African American communities in South Florida for many years,[38] which may have led to greater community acceptance; moreover it is possible that the intense outreach efforts and services targeting these communities have allowed for PLWHA to feel less stereotyped and more comfortable with their diagnosis.

Behavioral factors including ARV adherence and diversion were also significantly tied to internalized stigma. Those who were adhering to their ARV regimen had lower HIV stigma related to stereotypes, disclosure, and social relationships, suggesting that the adherent experienced less distress related to their HIV status. These findings seem to resonate with other recent studies of substance abusing PLWHA, which have documented that differences in stress tolerance (one's ability or perceived capacity to tolerate distress) and health care provider interest and satisfaction also play an important role in ARV medication adherence.[39,40] In contrast, diverters had higher stigma related to disclosure, indicating that perhaps the need or desire to conceal HIV status could potentially play a role in the decision to divert medications. Although these associations did not remain significant in the multivariate analyses, these results may indicate that decreases in stigma related to disclosure would be useful in promoting adherence and reducing diversion among this highly marginalized population of PLWHA, making this a potential target for intervention. The contextual factor of time since diagnosis was also related to stigma. Those reporting a diagnosis 13 years ago or more had significantly lower levels of stigma related to disclosure and self-acceptance. These results complement numerous studies documenting that more recently diagnosed individuals experience significantly higher levels of HIV related stigma.[5,10,11,19,20] Similarly, length of time taking ARV medications was also significantly associated with lower stigma related to self-acceptance and disclosure concerns.

Results from the multivariate analyses indicate that higher levels of social support are associated with decreased stigma related to stereotypes, self-acceptance, and social relationships; these findings are consistent with other literature showing that higher social support is associated with lower levels of HIV stigma.[20] The multivariate analyses also showed self-acceptance to be associated with numerous factors; specifically, those reporting severe substance dependence had higher levels stigma related to self acceptance; lower levels of self-acceptance stigma were associated with higher social support, more favorable ARV attitudes, and better treatment access. Since provider satisfaction has been found to be associated with ARV adherence in other substance abusing populations of PLWHA,[40] our findings seem to highlight the importance of interventions addressing stigma related to self acceptance as targets to increase engagement and retention in HIV care. Our results also help to illustrate the documented relationship between self-acceptance stigma and social support; self-acceptance has been found to serve as a first step in the process of reintegrating and re-connecting with loved ones post HIV diagnosis.[2]

Limitations

There are several limitations to this study. This sample, although large, is not representative, given that recruitment for the study was limited to substance using, indigent individuals in high poverty areas. Further, given the focus on ARV diversion, it is likely that our sample is different from other HIV-positive community based samples, making it difficult to generalize our results. The study also relied on self-report data, which is subject to reporting and social desirability bias and recall problems; however, the high levels of mental health problems, substance dependence, diversion,

and low adherence reported suggest that data were not biased by substantial under-reporting of socially undesirable behaviors. This research is also based on cross-sectional data, which does not allow for the examination of changes over time. This limits our ability to assess the directionality of these associations; as such, our data do not provide direct evidence that reducing stigma would improve ARV adherence or the uptake of HIV care. Nevertheless, these strong associations suggest that interventions related to stigma may be useful in promoting more positive health outcomes for PLWHA. Finally, our measure of HIV stigma only contained a small number of items and does not take into account the fact that multiple and layered stigmas are likely interacting among this sample. Based on the data presented here, we are unable to consider the interaction of multiple stigmas, given that the nature of stigma can vary for the same person across contexts.[41] It would be important for future research to examine how these aspects interact to get a better understanding of how they may influence PLWHA.[13]

Conclusions

Although the early management and treatment of HIV has been shown to reduce disease-related morbidity and improve long-term health and quality of life,[42,43] our findings complement the existing literature indicating that HIV-related stigma represents a significant barrier for PLWHA in accessing HIV care and engaging in appropriate disease management behaviors.[44,45] Given that HIV disproportionately impacts those in poverty and those already marginalized by minority status, sexual orientation, or substance abuse, stigma is likely experienced on multiple or intersecting levels related to these challenging life circumstances, coupled with the diagnosis of HIV/AIDS.[2,13,41,46,47] Our findings suggest that those with substance dependence, depression, and lower levels of social support are more vulnerable to experiencing higher levels of HIV-related stigma. These findings have critical public health implications, including the importance of developing specifically tailored interventions to decrease internalized HIV-related stigma, and specifically self-acceptance stigma. Among PLWHA with high levels of competing needs, these interventions would appear to be potential avenues for increasing adherence and routine utilization of HIV care.

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Author Disclosure Statement

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