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Poverty stigma is associated with suboptimal HIV care and treatment outcomes among women living with HIV in the U.S.

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Abstract

Objective: To examine whether experienced poverty stigma is associated with worse HIV care and treatment outcomes.

Design: We analyzed cross-sectional data from 433 women living with HIV enrolled in the Women's Adherence and Visit Engagement (WAVE) sub-study of the Women's Interagency HIV Study (WIHS).

Methods: Exposure was experienced poverty stigma, measured using the Perceived Stigma of Poverty Scale. Outcomes were viral suppression, CD4 cell count ≥350 cells/mm^3, and attending all HIV care visits in the past six months. Multivariable logistic regression models adjusted for

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income, age, race/ethnicity, education, substance use, months taking ART, number of antiretroviral pills in ART regimen, unstable housing, relationship status, and exchanging sex for money, drugs or shelter. We also explored whether self-reported ≥ 95% ART adherence mediated the relationship between poverty stigma and viral suppression and CD4 cell count ≥350 cells/mm^3.

Results: Experienced poverty stigma was associated with lower adjusted odds of viral suppression (adjusted odds ratio (aOR): 0.76; 95% Confidence Interval (CI): 0.61, 0.96), CD4 cell count ≥350 cells/mm^3 (aOR: 0.69; 95% CI: 0.52, 0.91), and attending all HIV care visits (aOR: 0.73; 95% CI: 0.54, 0.98). Exploratory mediation analysis suggests that ≥ 95% ART adherence significantly mediates the relationship between experienced poverty stigma and viral suppression and CD4 cell count ≥350 cells/mm^3.

Conclusion: Longitudinal research should assess these relationships over time. Findings support interventions and policies that seek to reduce poverty stigma among people living with HIV.

Keywords

Poverty stigma; HIV care and treatment; women living with HIV; United States

Introduction

Low-income individuals are disproportionately affected by HIV,[1] experience worse HIV treatment outcomes,[2] and have increased risk of HIV-related mortality.[3–5] Disparities in HIV-related health outcomes may be due to financial barriers in accessing HIV care and treatment.[2] However, studies suggest that socioeconomic disadvantage remains associated with worse HIV-related health outcomes even in the context of universal free access to health care,[2, 4] which suggests that the adverse effect of socioeconomic disadvantage on HIV-related health outcomes may go beyond access or affordability of care and treatment.

Stigma related to poverty may be one mechanism linking socioeconomic disadvantage to poor HIV-related health outcomes. Stigma is the process of labeling, separating, and discriminating against individuals possessing an attribute that is devalued by society.[6] Discrimination on the basis of these attributes is referred to as experienced stigma.[7] Low-income individuals have long been stigmatized in societies around the world.[8] Poverty stigma stems from the belief that one's economic status is dependent on individual effort.[9] As a result, individuals living in poverty are viewed as lazy and immoral because their status implies that they have not worked hard enough to raise themselves out of poverty.[9, 10]

Prior research suggests that experienced poverty stigma can negatively impact individuals' health.[11, 12] For example, qualitative studies suggest that low-income individuals can experience stigmatizing attitudes from health care or other service providers, which limits their willingness to access support services including health care, resulting in worse health outcomes.[11, 12] However, to our knowledge no study has examined the effect of poverty stigma on HIV care and treatment outcomes. This is a particularly important area to explore given that HIV disproportionately affects low-income populations in the U.S.,[1] and low-income individuals have increased risk for suboptimal HIV treatment outcomes.[2] We examined whether experienced poverty stigma is associated with worse HIV care and

treatment outcomes while controlling for income levels and other markers of socio-economic status.

Methods

Study design and sample

The Women's Interagency HIV Study (WIHS) is a multi-site, prospective cohort study of women living with and at risk for HIV in the U.S.[13] Biological, clinical, demographic, and behavioral data are collected semi-annually through interviews, physical exams, and laboratory tests. Participants provide signed informed consent at each visit. The Women's Adherence and Visit Engagement (WAVE) sub-study collects annual data on psycho-social aspects of living with HIV from women living with HIV on antiretroviral therapy (ART) enrolled at four WIHS sites: San Francisco, California, Atlanta, Georgia, Birmingham, Alabama, and Jackson, Mississippi. Participants in WAVE complete an interviewer-assisted data collection procedure during a separate research visit from their regular WIHS visit. WAVE survey data are linked with data collected through WIHS, which includes ART adherence and HIV visit adherence, as well as blood draws for assessment for HIV RNA level and CD4 counts. The present study uses data from the first round of WAVE questionnaires (2016–2017; N = 453). Twenty participants were excluded from this analysis due to missing data on covariates of interest, leaving a final sample of 433.

Measures

Outcomes—Outcomes included HIV viral suppression, CD4 cell count ≥ 350 cells/mm^3, and self-reported attendance of all HIV care visits in the past six months. HIV viral suppression was a binary variable, defined as < 20 copies/ml. CD4 cell count was dichotomized at 350 cells/mm^3, as has been done in previous research.[14] HIV care visit attendance was a binary variable derived from asking participants if they missed any HIV care appointments in the past six months (0) vs. missing no HIV care visits (1), as done in past research.[15]

Exposure—Experienced poverty stigma was measured using a sub-scale of the perceived stigma of poverty scale (see Table, Supplemental Digital Content 1, which outlines the sub-scale items).[16] Participants were asked to think about the past 12 months and to indicate how much they agreed with four statements using a five-point scale ranging from 1 (definitely disagree) to 5 (definitely agree). Scale scores were calculated by taking the mean of all four items. Internal consistency was strong in this sample (α=0.88).

Covariates—Covariates included age at visit (continuous variable), average annual household income (≤$12,000, $12,001-$24,000, or ≥$24,001), education (high school education or more vs. less than a high school education), race/ethnicity (non-Hispanic white vs. other), any non-prescribed substance use since the last WIHS visit, months on ART (continuous), total number of antiretroviral pills in ART regimen (one pill vs. > one pill), current relationship status (in a sexual/romantic relationship vs. not), unstable housing, and ever exchanged sex for drugs, money or shelter. Recent non-prescribed substance use was defined as self-reported cocaine, crack, heroin, methamphetamine, hallucinogens, club

drugs, non-prescribed narcotics, or any other non-prescribed recreational drugs, excluding any form of marijuana, in the last six months. Unstable housing was defined as currently living in a halfway house, shelter, welfare house, on the street or in a residential drug or alcohol treatment facility (vs. an apartment or house). Covariates were included in multivariable models based on a priori knowledge from theory and existing literature of their potentially confounding relationship with poverty stigma and the three outcomes.[17–19]

ART adherence was assessed by asking participants how often they took ART as prescribed over the past six months. Answer choices ranged from “100% of the time” to “I haven’t taken any of my antiretroviral medications”. This variable was dichotomized to represent ≥ 95% adherence vs. < 95% adherence, as done in prior research.[18]

Analysis

Summary statistics were calculated on all study participants for all variables. Multivariable logistic regression models assessed the relationship between experienced poverty stigma and the three outcomes. Covariates hypothesized as potential mediators of the relationship between poverty stigma and the three outcomes were not included in the multivariable models. Multivariable models for viral suppression and CD4 ≥ 350 cells/mm^3 adjusted for all covariates. The multivariable model for HIV care visit attendance adjusted for all covariates except for the number of antiretroviral pills in ART regimen, as this variable was neither theoretically associated with visit attendance nor statistically significantly associated with visit attendance in bivariate analysis.

As an exploratory analysis, we assessed whether self-reported ART adherence mediated the relationship between experienced poverty stigma and viral suppression and CD4 ≥ 350 cells/mm^3. This was done given evidence suggesting that ART adherence is critical to achieving viral suppression and improving CD4 cell counts.[20] Mediation was assessed using indirect effects analysis with bootstrapping for dichotomous outcomes.[21] In this method, mediation is suggested when there is a significant indirect effect, which is indicated by a percentile bootstrapped confidence interval that does not include zero. All analyses were performed using STATA 15.[22]

All study activities were approved by each site’s Institutional Review Board. This study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Results

The demographic characteristics of the sample are displayed in Table 1. Findings from the adjusted analyses of the association of experienced poverty stigma with the three outcomes are presented in Table 2. After adjusting for covariates, experienced poverty stigma was significantly associated with reduced odds of viral suppression (adjusted odds ratio (aOR): 0.76; 95% confidence interval (CI): 0.61, 0.96), reduced odds of having a CD4 count of ≥ 350 cells/mm^3 (aOR: 0.69; 95% CI: 0.52, 0.91) and reduced odds of attending all HIV care visits in the past six months (aOR: 0.73; 95% CI: 0.54, 0.98).

Findings from the exploratory mediation analysis suggest that ≥ 95% ART adherence significantly mediates the relationship between experienced poverty stigma and viral suppression (coefficient: −0.05; 95% CI: −0.10, −0.01) and having a CD4 count of ≥ 350 cells/mm^3 (coefficient: −0.05; 95% CI: −0.11, −0.01) after adjusting for all covariates.

Discussion

This study found that poverty stigma is significantly associated with lower odds of viral suppression, having a CD4 cell count of ≥ 350 cells/mm^3, and attending all HIV care visits in the past six months even after adjusting for income level and education. These findings suggest that it is not only socioeconomic disadvantage that contributes to poor HIV care and treatment outcomes among this population, but that experienced poverty stigma may be an important independent contributor to negative health outcomes even after adjusting for indicators of poverty such as income, education and unstable housing. To our knowledge, this is the first study that has explored the relationship of poverty stigma with HIV care and treatment outcomes. Other forms of stigma such as HIV stigma have similarly been associated with worse HIV treatment outcomes.[19, 23–26]

Findings from our exploratory mediation analysis suggest that the relationship between poverty stigma and the clinical outcomes of viral suppression and CD4 count is mediated by a behavioral pathway of self-reported ≥ 95% ART adherence. This is supported by prior research documenting that ART adherence is critical to achieving viral suppression and improving CD4 cell counts.[20] Other mechanisms may also explain the relationship between poverty stigma and HIV care and treatment outcomes, but exploring these were beyond the scope of this study.

Additionally, low-income individuals, including those living with HIV, have reported perceived discrimination from healthcare providers based on their financial status,[27, 28] which has been associated with reduced engagement in healthcare,[29] including HIV care and treatment.[18, 25, 30] Future research should explore how perceived discrimination from healthcare providers influences the relationship between poverty stigma and HIV care and treatment outcomes.

This study has several important limitations. Due to the cross-sectional design, we were unable to specify the temporal and causal relationship of poverty stigma, ART adherence and the HIV care and treatment outcomes. Longitudinal research is needed to assess the relationship of poverty stigma with HIV care and treatment outcomes over time, as well as potential mediators of this relationship. Given that the sample was from four primarily urban centers in the U.S. and consisted primarily of African American women, further research is needed to confirm these findings among women in other settings and of other racial/ethnic backgrounds, as well as among men.

Despite these limitations, this study is an important first-step to improve our understanding of the relationship between poverty stigma and HIV care and treatment outcomes among women living with HIV. Given how little is known about the effect of poverty stigma on health, future research should confirm these findings and explore the effects of poverty

stigma on other health outcomes among people living with HIV. Such research could shed light on avenues for future interventions and policies to reduce poverty stigma and improve health outcomes among this population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Demographic characteristics (N=433)

Characteristics	N (%)
Age, mean (SD)	49.0 (9.4)
Average annual household income	
≤$12,000	246 (56.8)
$12,001–$24,000	99 (22.9)
≥$24,001	88 (20.3)
High school graduated or more schooling	311 (71.8)
Non-Hispanic white race/ethnicity	60 (13.9)
Non-prescribed drug use since last visit	139 (32.1)
Currently in a sexual or romantic relationship	180 (41.6)
Unstable housing	30 (6.9)
Ever exchanged sex for drugs, money or shelter	158 (36.5)
Months on ART, mean (SD)	103.9 (71.9)
More than one antiretroviral pill in regimen[a]	195 (48.3)
Experienced poverty stigma, mean (SD)	2.5 (1.1)
Virally suppressed[b,c]	293 (68.9)
CD4 cell count ≥ 350 cells/mm^3	366 (84.5)
≥ 95% adherence[a]	340 (84.2)
Attended all HIV care visits in the past 6 months[d]	378 (88.5)

[a] n=404

[b] n=425

[c] Viral suppression was defined as <20 copies/ml

[d] n=427

Table 2.

Adjusted associations between experienced poverty stigma and outcomes

Outcomes	Experienced Poverty Stigma
Viral suppression[a, b, c]	0.76 (0.61, 0.96) *
CD4 cell count ≥350 cells/mm^3 [b, d]	0.69 (0.52, 0.91) **
Attending all HIV care visits in past 6 months[e, f]	0.73 (0.54, 0.98) *

* p<0.05;

** p<0.01

[a] Viral suppression was defined as < 20 copies/ml

[b] Adjusted for age, education, income, race/ethnicity, illicit drug use since last visit, months on ART, number of antiretroviral pills in regimen, unstable housing, relationship status and ever exchanged sex for drugs, money or shelter.

[c] n= 393 for the adjusted model of experienced poverty stigma on viral suppression

[d] n= 399 for the adjusted model of experienced poverty stigma on CD4 cell count ≥350 cells/mm^3

[e] Adjusted for age, education, income, race/ethnicity, illicit drug use since last visit, months on ART, unstable housing, relationship status and ever exchanged sex for drugs, money or shelter.

[f] n=411 for the adjusted model of experienced poverty stigma on attending all HIV care visits in past 6 months