



Age, Sex, Race, Ethnicity, Sexual Orientation: Intersectionality of Marginalized-Group Identities and Enacted HIV-Related Stigma Among People Living with HIV in Florida

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Abstract

HIV-related stigma is associated with many negative health outcomes among people living with HIV (PLHIV). The theory of intersectionality suggests that the interactions of social identities affect PLHIV's experiences of stigma. This study aims to identify individual and interactive marginalized-group identities correlated with enacted HIV-related stigma among PLHIV in Florida. The sample (n=932) was majority male (66.6%), Black (58.5%), and non-Latino (80.2%) with 53% reporting experiences of HIV-related stigma. In multinomial regression models, the interaction between race and ethnicity was significant where non-White Latinos had higher odds of experiencing high levels of enacted stigma [AOR (CI) 7.71 (2.41, 24.73), $p < 0.001$] compared to white non-Latinos. Additionally, racial minorities were less likely to have experienced moderate or high levels of enacted stigma [AOR (CI) 0.47 (0.31, 0.72), $p < 0.001$; AOR (CI) 0.39 (0.22, 0.70), $p = 0.002$, respectively]. Moreover, women had higher odds of experiencing high levels of enacted stigma [AOR (CI) 2.04 (1.13, 3.67), $p = 0.018$]. The results suggest that intersectionality is important to consider in HIV-related stigma research and future interventions.

Keywords Stigma · HIV/AIDS · Florida · Intersectionality

Resumen

El estigma relacionado con el VIH se asocia con muchos resultados de salud negativos entre las personas que viven con el VIH. La teoría de la interseccionalidad sugiere que las interacciones de las identidades sociales afectan las experiencias de estigma de las personas que viven con el VIH. Este estudio tiene como objetivo identificar las identidades individuales e interactivas de grupos marginados correlacionadas con el estigma promulgado relacionado con el VIH entre las personas

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que viven con el VIH en Florida. La muestra ($n=932$) fue mayoritariamente masculina (66.6%), negra (58.5%) y no Latina (80.2%) con 53% reportando experiencias de estigma promulgado relacionado con el VIH. En los modelos de regresión multinomial, la interacción entre raza y etnicidad fue significativa donde los Latinos no blancos tenían mayores probabilidades de experimentar altos niveles de estigma promulgado ($ORa(IC)=7.71(2.41, 24.73)$, $p<0.001$) comparado con los blancos no Latinos. Además, las minorías raciales tenían menos probabilidades de haber experimentado niveles moderados o altos de estigma promulgado ($ORa(IC)=0.47(0.31, 0.72)$, $p<0.001$; $ORa(IC)=0.39(0.22, 0.70)$, $p=0.002$, respectivamente). También, las mujeres tenían mayores probabilidades de experimentar altos niveles de estigma promulgado ($ORa(IC)=2.04(1.13, 3.67)$, $p=0.018$). Los resultados sugieren que es importante considerar la interseccionalidad en la investigación del estigma relacionado con el VIH y en futuras intervenciones.

Abbreviations

PLHIV	People living with HIV/AIDS
HIV	Human immunodeficiency virus
AIDS	Acquired immunodeficiency syndrome
SHARC	Southern HIV & Alcohol Research Consortium

Background

In 2017, an estimated 108,003 people were living with HIV/AIDS (PLHIV) in Florida [1]. Since the beginning of the HIV epidemic, PLHIV have faced stigma taking the form of ostracism, discrimination, and even violence [2–4]. HIV-related stigma is associated with many negative psychological [3, 5–10], physical [9–11], and behavioral health outcomes [5, 6, 9, 12–14]. Additionally, HIV-related stigma has been found to be a considerable barrier in HIV prevention and treatment [6, 12, 13, 15, 16]. As the incidence of HIV in Florida has seen a 13.7% increase since 2013 [17], it becomes increasingly important to prevent current HIV cases from spreading by focusing on factors such as HIV-related stigma, that may prevent individuals from seeking care.

HIV-related stigma in PLHIV can be split into four separate constructs, including: enacted, community, anticipated, and internalized stigma [18]. Internalized stigma is internal negative feelings that occur about oneself, while enacted stigma is negative external experiences that occur due to specific conditions or attributes that one has [18]. Moreover, community stigma refers to the perceived stigma within a person's surroundings, and anticipated stigma is the internal fear that once one's status is revealed, people will treat them negatively [18]. The present study plans to focus on enacted HIV-related stigma utilizing a modified scale developed by Herek et al. [3]. Enacted stigma measures were chosen as we were interested in how direct negative actions by others are experienced in PLHIV with varying demographics.

The concept of intersectionality is one theory that has been discussed in the field of HIV-related stigma. Intersectionality research focuses on how the interrelation of people's social identities affects their experiences of inequity [19, 20]. A marginalized-group identity, in sociological terms, is defined as an identity that lacks societal power in

comparison to the dominant group identity, regardless of identity group size. The two main approaches in the study of intersectionality are the additive approach and the multiplicative approach [21]. In the additive approach, each addition of a marginalized-group identity yields an overall increase of societal marginalization [21]. The additive approach lacks support due to its consideration of marginalized-group identities as separate and independent from one another [22]. Additionally, some researchers reject the additive approach's ranking of one's identities, as people can belong to both dominant and marginalized groups [22]. However, in the multiplicative approach, social outcomes (such as stigma) are based on the interactions between demographic identities. Due to the complexities of intersectionality, it is important to acknowledge that different combinations of social identities, geography, and inequity can create differences in the experience of HIV-related stigma [23].

To date, few quantitative studies have examined the association between the intersectionality of multiple marginalized-group identities and HIV-related stigma in the United States [24–26]. However, qualitative and theory-based studies conducted in the US have indicated intersectionality as an important variable when analyzing HIV-related stigma [27–30]. These US studies agree that an intersectional approach to research can help identify the social and institutional forces that shape inequity [27–30]. Additionally, recent studies conducted in countries such as Canada focus on quantitative research in the measurement of HIV-related stigma as it relates to intersectionality [10, 23, 31]. The study conducted by Loutfy et al. [23] found that the interaction between gender and race/ethnicity was significantly correlated with HIV-related stigma, where being female and non-White were shown to have significantly higher rates of cumulative and sub-scale rates of HIV-related stigma. The studies conducted by Logie et al. [10, 31] examined the intersectionality of marginalized-group discrimination and HIV-related stigma, and its association with physical and mental health outcomes. This study found significant correlations between gender discrimination, racial discrimination, and HIV-related stigma. Though the studies by Loufty et al. and Logie et al. [10, 23, 31] demonstrated the importance of intersectionality in HIV-related stigma, their studies combined Hispanic ethnicity with Asian/Aboriginal identities

[23] & African and Black identities [10, 31]. Our study plans to look at Latino ethnicity separately, to allow for a more specific analysis of Latino identity and its association with enacted HIV-related stigma. Specific knowledge on Latino PLHIV is of particular importance, especially in a U.S. context, as it is a demographic with a disproportionate burden of the disease [1].

The state of Florida's HIV Prevention and Care Plan for 2017–2021 acknowledges that one of the main barriers to HIV screening, prevention, and care is HIV-related stigma [32]. Nine of the State's integrated plan activities to screen, prevent, and care for HIV include specific stigma reduction measures [32]. On the federal level, the National Institutes of Health have also recognized the importance of stigma reduction and intersectionality in HIV prevention and have set funding opportunities to meet these needs [33]. Studies that examine intersectionality and HIV-related stigma will better inform both state and national strategies on the best way to combat this issue.

The primary objective of this study is to identify marginalized-group identities, the interactions among them, and to examine their association with different levels of enacted HIV-related stigma experienced among PLHIV in Florida. Specifically, the research questions posed are the following: (1) which individual demographic factors are associated with enacted HIV-related stigma? and (2) are there significant interactions between demographic factors that show an association with levels of enacted HIV-related stigma experienced?

Methods

Study Design and Population

We utilized baseline data collected by the Florida Cohort Study from 2014 to 2017. The Florida Cohort Study, an ongoing project under the Southern HIV & Alcohol Research Consortium (SHARC), has goals to assess how individual, clinical, and community level factors influence accessibility and use of healthcare as well as HIV clinical outcomes. Participants were recruited at nine public health sites throughout Florida (University of Florida Health, Alachua County, Hillsborough County, Orange County, Columbia County, Sumter County, Seminole County, Broward County, and Miami-Dade County) utilizing convenience sampling. Patients were eligible for inclusion if they were ≥ 18 years old and living with HIV. HIV status was confirmed by proof of HIV test results or antiretroviral prescription bottle with the participant's name. Informed consent was obtained from all participants at the recruitment site regardless of whether they decided to complete the survey at the study site or at-home. After obtaining

written consent, surveys were self-administered on a computer using a secure web-based app called *Research Electronic Data Capture (REDCap)*. For those who did not want to do the survey on REDCap, a paper-based option was available. Surveys were taken in English or Spanish, were completed at HIV care clinics or at-home, and consisted of questions that assessed demographic, behavioral, mental, and social factors among study participants. If a participant wanted to complete the online version of the survey at-home, they were sent a link to the survey using their provided email address. Surveys took approximately 30 to 45 min to complete and participants were compensated with a \$25 gift card for their time. The methods of this study have also been outlined in other studies [34, 35]. The protocol of this study was approved by the Florida International University, Florida Department of Health, and University of Florida Institutional Review Boards.

Measures

Demographics

Demographic items included age (years), race (white, black/African American, Native American, Asian, or multi-racial), sex at birth (male or female), sexual orientation (gay/lesbian, heterosexual/straight, bisexual, or asexual), and ethnicity (Latino or Non-Latino). Sexual orientation was based on self-report and not based on sexual activity to be inclusive of those who may be sexually attracted to the same sex, but have not engaged in sexual activity with someone of the same sex.

Other variables that we adjusted for in models but did not show included: HIV-disclosure (no one, main partner only, immediate family only, friends/other relatives only, more than 1 group), homelessness, education (< high school, high school graduate/GED, some college/trade school, college/trade school graduate, masters/professional degree after college), and social support. These variables were chosen as they have been found to be associated with the HIV-related stigma in previous studies and their inclusion in our model could diminish possible confounding [10, 23, 31, 36]. Homelessness was defined as having lived in a homeless shelter, emergency shelter, car, street, or abandoned building in the past 12 months. Social support was measured using the emotional/informational and tangible support factors from the instrument developed by Sherbourne and Stewart [37]. All variables were self-reported by participants.

We considered whether to adjust for clustering by recruitment location, but analysis indicated no effect so we present the data without adjusting for clustering by recruitment location.

Herek HIV Stigma Scale

The primary outcome of interest for this study was measured using a modified version of the Herek Enacted Stigma Index Items [3]. The stigma scale was modified to only include enacted stigma measures. The section contained 10 statements, and for each the participants responded to “how often you have ever felt that the following experiences happened?”, using a 4-point Likert scale ranging from “Never” (value = 0) to “3 + times” (value = 3) ($\alpha = 0.89$). Sample items included “A family member stopped speaking to me when they found out I have HIV,” “A doctor, nurse, or health care worker avoided me or refused to take care of me because I have HIV,” etc. The stigma score results were then categorized as none (indicative of the participant never having felt enacted stigma), moderate (indicative of the participant scoring 1–10) and high (indicative of the participant scoring 11+).

Marginalized-Group Identity Variables

Variables in the analysis included: age, biological sex, race, ethnicity, and sexual orientation. These variables were dichotomized to indicate marginalized-group identity. Attributes of being middle-aged (aged 40–65 years), male, white, non-Latino, or heterosexual classified the corresponding variable as non-marginalized-group. All other responses for each variable were classified as identifying with the marginalized-group.

Analysis

We conducted our secondary data analysis using SAS (v9.4; SAS Institute Inc., Cary, NC). Descriptive characteristics were used to report sample characteristics and categories for the modified Herek Enacted Stigma Index Items based on participants’ level of experience with enacted HIV-related stigma. Univariate multinomial logistic regression models were conducted to assess the impact of each marginalized-group identity variable on experiencing enacted HIV-related stigma. After, interactive multinomial logistic regression models were run between all combinations of marginalized-group identity variables to identify significant interactions in the model. Finally, marginalized-group identity variables and interactions were then analyzed together in a multivariate multinomial logistic regression analysis while also adjusting for HIV-disclosure, homelessness, education, and social support. To be considered significant, we set α to 0.05.

Results

Cohort Characteristics, Marginalized-Group Identities, and Enacted HIV-Related Stigma

Our study contained a sample of $n = 932$ PLHIV across several sites in Florida. Fifty-four participants were removed from the final analysis as they either had incomplete Herek Enacted Stigma Index Items ($n = 38$), identified as transgender/gender non-conforming ($n = 16$), or both ($n = 1$) leaving a final sample of $n = 878$. From our final sample 82.4% completed their survey on paper at the recruitment site, 10.3% completed online at the recruitment site, and 7.3% completed on paper at home. Additionally, 91.5% of our sample completed the English version of the survey while 8.5% completed the Spanish version of the survey.

The average age of our total sample was 46.6 ± 11.3 years with a range of 19–77 years. The sample was majority male (66.0%), Black (58.0%), non-Latino (80.4%), and heterosexual (53.4%). Among those who identified as Latino (19.6%), 56.2% identified as White, 15.2% identified as Black, and 28.7% identified as other/multi-racial. Some common responses for ‘other’ race among Latinos included: Latino/Hispanic, country of origin (i.e., Puerto Rican, Mexican, Cuban, Spanish), and mestizo.

The overall mean of enacted HIV-related stigma scores was 3.9 ± 6.0 with a range of 0–30 scores, where the mean of enacted HIV-related stigma scores in participants who have experienced any enacted HIV-related stigma was 7.2 ± 6.5 . Our sample was comprised of 46.7% experiencing no enacted stigma, 39.8% experiencing moderate levels of enacted stigma, and 13.5% experiencing high levels of enacted stigma. The characteristics of our sample stratified by experience of enacted HIV-related stigma can be found in Table 1.

Unadjusted Multinomial Logistic Regression Analysis of Individual Marginalized-Group Identities and Enacted HIV-Related Stigma

The crude multinomial regression models found that those with a racial marginalized-group identity (non-White) had decreased odds of experiencing moderate and high levels of enacted HIV-related stigma [Crude Odds Ratio (95% Confidence Interval) 0.53 (0.39, 0.72), $p < 0.001$; COR (CI) 0.63 (0.41, 0.98), $p = 0.040$, respectively] (Table 2). However, the crude multinomial regression also revealed that those with a sexual orientation marginalized-group identity had increased odds of experiencing

Table 1 Descriptive baseline sample statistics of the Florida cohort stratified by enacted HIV-related stigma experience, 2014–2017

	Never experienced enacted HIV-related stigma (n = 410)		Experienced moderate enacted HIV-related stigma (n = 349)		Experienced high enacted HIV-related stigma (n = 119)	
	N (%)	Mean ± SD	N (%)	Mean ± SD	N (%)	Mean ± SD
Age (years)		46.8 ± 12.2		46.4 ± 10.5		46.0 ± 10.0
< 40 years old ^a	108 (26.3)		89 (25.5)		30 (25.2)	
40–65 years old	283 (69.0)		252 (72.2)		87 (73.1)	
> 65 years old ^a	19 (4.6)		8 (2.3)		2 (1.7)	
Biological sex						
Male	265 (64.6)		242 (69.3)		72 (60.5)	
Female ^a	145 (35.4)		107 (30.7)		47 (39.5)	
Race						
White	106 (25.9)		139 (39.8)		42 (35.3)	
Black ^a	267 (65.1)		180 (51.6)		62 (52.1)	
Other ^a	37 (9.0)		30 (8.6)		15 (12.6)	
Ethnicity						
Non-Latino	332 (81.0)		282 (80.8)		92 (77.3)	
Latino ^a	78 (19.0)		67 (19.2)		27 (22.7)	
Sexual orientation						
Heterosexual	229 (57.7)		161 (48.5)		60 (52.6)	
Homosexual ^a	130 (32.8)		131 (39.5)		39 (34.2)	
Bisexual ^a	31 (7.8)		36 (10.8)		14 (12.3)	
Other ^a	7 (1.7)		4 (1.2)		1 (0.9)	
Education						
< High school	142 (34.6)		113 (32.7)		49 (41.2)	
High school/GED	132 (32.2)		97 (28.0)		32 (26.9)	
Some college/trade school	79 (19.3)		79 (22.8)		23 (19.3)	
College/trade school grad.	39 (9.5)		44 (12.7)		11 (9.2)	
Graduate/professional degree	18 (4.4)		13 (3.8)		4 (3.4)	
Homelessness						
Yes	39 (9.5)		71 (20.3)		30 (25.2)	
No	371 (90.5)		278 (79.7)		89 (74.8)	
Social support		72.9 ± 23.0		67.3 ± 20.9		60.0 ± 22.8
Disclosure						
None	3 (0.9)		0 (0.0)		0 (0.0)	
Immediate family only	37 (10.6)		23 (7.0)		6 (5.1)	
Partner only	37 (10.6)		9 (2.7)		3 (2.6)	
Friends/other relatives only	29 (8.3)		31 (9.4)		9 (7.7)	
More than 1 group	243 (69.6)		266 (80.9)		99 (84.6)	

^aRepresents the identities classified as marginalized

moderate levels of enacted HIV-related stigma [COR (CI) 1.45 (1.08, 1.94); $p=0.013$], but not high levels of enacted HIV-related stigma [COR (CI) 1.23 (0.81, 1.86); $p=0.338$]. Age, biological sex, and ethnic marginalized-group identities were not statistically significant in the multinomial regression model.

Detection of Marginalized-Group Identity Interactions with Enacted HIV-Related Stigma

It was found that the interaction between racial marginalized-group identity and ethnic marginalized-group identity yielded significantly higher odds of experiencing

Table 2 Crude multinomial logistic regression analysis of marginalized-group on enacted HIV-related stigma among 878 PLWH in Florida

	Moderate enacted stigma ^a		High enacted stigma ^a	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
Age				
40–65 years old	–	–	–	–
<40 or >65 years old	0.86 (0.63, 1.17)	0.338	0.82 (0.52, 1.29)	0.393
Biological sex				
Male	–	–	–	–
Female	0.81 (0.60, 1.10)	0.170	1.19 (0.78, 1.82)	0.410
Race				
White	–	–	–	–
Non-White	0.53 (0.39, 0.72)	<0.001	0.63 (0.41, 0.98)	0.040
Ethnicity				
Non-Latino	–	–	–	–
Latino	1.01 (0.70, 1.45)	0.951	1.25 (0.76, 2.05)	0.378
Sexual orientation				
Heterosexual	–	–	–	–
Non-heterosexual	1.45 (1.08, 1.94)	0.013	1.23 (0.81, 1.86)	0.338

Bold values indicate *p* < 0.05

^aReference group is no enacted stigma

Table 3 Assessment for interactions using multinomial logistic regression^b

	Age OR (CI), <i>p</i>	Biological sex OR (CI), <i>p</i>	Race OR (CI), <i>p</i>	Ethnicity OR (CI), <i>p</i>	Sexual orientation OR (CI), <i>p</i>
Moderate versus no enacted stigma					
Age	–				
Biological sex	0.94 (0.48, 1.87), <i>p</i> = 0.865	–			
Race	1.34 (0.67, 2.67), <i>p</i> = 0.409	0.69 (0.33, 1.43), <i>p</i> = 0.315	–		
Ethnicity	1.59 (0.72, 3.51), <i>p</i> = 0.252	1.19 (0.49, 2.88), <i>p</i> = 0.705	2.20 (1.02, 4.74), <i>p</i> = 0.046	–	
Sexual orientation	0.93 (0.48, 1.79), <i>p</i> = 0.825	0.66 (0.26, 1.66), <i>p</i> = 0.377	1.47 (0.77, 2.83), <i>p</i> = 0.246	0.50 (0.23, 1.06), <i>p</i> = 0.072	–
High versus no enacted stigma					
Age	–				
Biological sex	1.30 (0.51, 3.32), <i>p</i> = 0.584	–			
Race	0.97 (0.37, 2.59), <i>p</i> = 0.958	0.59 (0.23, 1.55), <i>p</i> = 0.288	–		
Ethnicity	1.77 (0.60, 5.18), <i>p</i> = 0.300	1.75 (0.60, 5.14), <i>p</i> = 0.309	7.68 (2.68, 22.01), <i>p</i> < 0.001	–	
Sexual orientation	0.56 (0.22, 1.42), <i>p</i> = 0.223	1.08 (0.35, 3.30), <i>p</i> = 0.898	1.50 (0.60, 3.74), <i>p</i> = 0.385	0.75 (0.27, 2.09), <i>p</i> = 0.577	–

^aBold values indicate *p* < 0.05

^bEquation used, where significance of interaction term is shown: $logit(P(Y=1)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2$

moderate and high levels of enacted HIV-related stigma [OR (CI) 2.20 (1.02, 4.74), *p* = 0.046; OR (CI) 7.68 (2.68, 22.01), *p* < 0.001; respectively]. No other marginalized-group identity interaction effects were found

to be statistically significant between no reported and moderate- or high levels of enacted HIV-related stigma (Table 3).

Adjusted Multinomial Logistic Regression Analysis of Individual Marginalized-Group Identities and Enacted HIV-Related Stigma

After adjusting for homelessness, HIV-disclosure, social support, and education, those with a racial marginalized-group identity (non-White) had decreased odds of experiencing moderate and high levels of enacted HIV-related stigma [AOR (CI) 0.48 (0.31, 0.73), $p < 0.001$; AOR (CI) 0.40 (0.22, 0.72), $p = 0.002$, respectively] as compared to no enacted stigma. In the adjusted model, biological sex marginalized-group identity (women) had higher odds of experiencing high levels of enacted HIV-related stigma [AOR (CI) 1.94 (1.08, 3.50), $p = 0.027$], but no significant difference between experiencing moderate enacted HIV-related stigma compared to no reported enacted HIV-related stigma [AOR (CI) 1.08 (0.70, 1.65), $p = 0.733$].

The interaction between racial and ethnic marginalized-group identities for experiencing high levels of enacted HIV-related stigma remained significant in the final model [AOR (CI) 8.69 (2.68, 28.18), $p < 0.001$]. That is, non-White Latinos had higher odds of experiencing high levels of enacted HIV-related stigma in comparison to White (non-Latinos) (Table 4).

Discussion

This study is one of the first quantitative studies to examine the association of interactions between marginalized-group identities and enacted HIV-stigma experienced by PLHIV. The primary finding of this study is that the interaction between racial and ethnic marginalized-group identifications yielded higher odds of experiencing high levels of enacted HIV-related stigma after adjusting for socio-economic, social support, and disclosure factors. Specifically, Non-white Latinos had higher odds of experiencing high levels of enacted HIV-related stigma. Additionally, we found that racial minorities had lower odds of ever experiencing enacted HIV-related stigma, while women had higher odds of experiencing high levels of enacted HIV-related stigma.

Black and Latino racial and ethnic group identities continue to be highly burdened by the HIV epidemic, where in 2017, they had the highest rates of new HIV infection (41.1 and 16.1 per 100,000, respectively) [1]; however, little has been done to address the difference in HIV outcomes between the intersection of race and ethnicity [38]. In the U.S., approximately 24% of Latinos identify as Afro-Latino [39], however HIV surveillance in national and state reports continue to classify White and Black Latinos in the same category [1, 40]. Due to this classification, the over

Table 4 Adjusted multinomial logistic regression analysis of marginalized-group on enacted HIV-related stigma among 878 PLWH in Florida

	Adjusted odds (moderate enacted stigma) ^a		Adjusted odds (high enacted stigma) ^a	
	OR (95% CI)	p	OR (95% CI)	p
Age				
40–65 years old	–	–	–	–
<40 or >65 years old	0.93 (0.64, 1.36)	0.710	0.87 (0.51, 1.49)	0.617
Biological sex				
Male	–	–	–	–
Female	1.08 (0.70, 1.65)	0.733	1.94 (1.08, 3.50)	0.027
Race				
White	–	–	–	–
Non-White	0.48 (0.31, 0.73)	<0.001	0.40 (0.22, 0.72)	0.002
Ethnicity				
Non-Latino	–	–	–	–
Latino	0.55 (0.30, 1.01)	0.053	0.43 (0.17, 1.07)	0.069
Sexual orientation				
Heterosexual	–	–	–	–
Non-heterosexual	1.35 (0.88, 2.08)	0.165	1.37 (0.76, 2.47)	0.301
Race × ethnicity				
White × non-Latino	–	–	–	–
Non-White × Latino	2.16 (0.88, 5.29)	0.091	8.69 (2.68, 28.18)	<0.001

Bold values indicate $p < 0.05$. Analyses are adjusted for homelessness, HIV-disclosure, Social support, and education

^aReference group is no enacted stigma

representation of White Latinos could be overshadowing major HIV disparities occurring among racially diverse Latinos. Previous research on the health and wellbeing of Non-White Latinos has found that Non-White Latinos face significant health disparities as it relates to hypertension, perceived health, and mental health outcomes [41, 42]. Racism among Latin Americans has limited opportunities for Non-White Latinos and has consequently affected their health [42, 43]. The overlapping of societal US racism and within group racial discrimination among Latinos could be a possible explanation of increased levels of enacted HIV-related stigma among Non-White Latinos. This finding adds to the call for research to look at colorism and how it impacts communities and individuals in the race-conscious U.S. [43].

Another explanation of increased levels of enacted HIV-related stigma among non-White Latinos could be the lack of non-White Latino specific HIV education/interventions. This study found that Non-White racial identification had decreased odds of experiencing enacted HIV-related stigma. This finding could be attributed to the increased focus of HIV knowledge and prevention interventions in at-risk, racial minorities [44]. Past research has found that increased knowledge in at risk communities may decrease enacted HIV-related stigma [45]. The increased levels of enacted HIV-related stigma among non-White Latinos and decreased levels among Black non-Latinos could be an artifact of state interventions not reaching specific sub-sections of racial minorities. Researchers have suggested that though behavioral interventions including cultural Latino aspects may be enough to reach non-White Latinos; non-White Latinos are a distinct sub-group that may need a more targeted approach [46]. Since racial minorities face a greater burden of HIV, another reason for decreased enacted HIV-related stigma could be that racial minorities are accepting HIV as a community issue, and not an issue based on stigmatized behavior or sexual orientation. In fact, the Kaiser Foundation Survey of Americans on HIV found that 63% of African Americans perceived the HIV epidemic as a larger burden in their community than in the White community, and 54% had a personal tie with someone living with HIV [47]. Due to the wide array of races within Latino communities, HIV may not be as widely accepted as a Latino specific issue. Previous research on racial and ethnic specific, HIV-related stigma interventions should be reviewed to determine the representation of the non-White Latino community and to assess the success of these interventions among this population.

Our study also found that women had higher odds of experiencing high levels of enacted HIV-related stigma. Based on qualitative findings of women living with HIV, previous studies found that women living with HIV, despite their actual circumstances, were often classified as prostitutes, drug users, or as engaging in other stigmatized risk behaviors [48–51]. Where men are often expected to or

applauded for their risk taking behaviors by society, societal gender norms often demonize engagement in risk taking behaviors for women. The high association of HIV infection with the breaking of women's gender norms could explain high levels of enacted HIV-related stigma among women living with HIV [28].

Implications of this study suggest that more qualitative research should be conducted to examine the exact mechanisms of how intersectionality affects the experiences of HIV-related stigma among PLHIV, especially among non-white Latinos. Understanding HIV-related stigma in various settings could be of increased importance for improving HIV services, retention in care, and consequently, disease progression but more studies need to be done [52]. To date, the HIV epidemic has been syndemic in racial, sexual, and ethnic minorities; however, our current national surveillance system is not capturing important intersections between identifications, such as non-White Latinos. National HIV surveillance strategies should be changed to be inclusive of race and ethnicity as separate constructs. In practice, interventions and public health campaigns should continue to combat HIV-related stigma, but should not forget to target sub-populations within overarching communities (i.e., non-White Latinos among racial minorities).

Limitations

First, our study participants were recruited using convenience sampling. Convenience sampling could have biased the findings as it is predicted that those who consented to be a part of the study and returned the completed survey would have experienced lower levels of enacted HIV-related stigma. Second, our study only included questions from the Herek Stigma Index Items that related to enacted stigma. Without the ability to measure community, anticipated, and internalized HIV-related stigma, we were unable to find differences between those constructs and enacted stigma in PLHIV. Since the goals of parent study were not specifically related to HIV-related stigma, data were only available on enacted HIV-related stigma for secondary analysis. Third, our outcome variable was measured as continuous but was converted to nominal due to the inability for the data to fit normality assumptions appropriate for a linear regression model. By converting a continuous measure to nominal categories, the study may have lost the precision to understand the effect of each unit change in reported enacted HIV-related stigma. Our study was unable to adjust for factors such as gender identity or language proficiency and their association with enacted HIV-related stigma. We were unable to adjust for gender identity due to the low number of transgender and gender non-conforming identifying individuals represented in our sample ($n = 17$), nor language proficiency due to its high correlation with ethnicity

($\chi^2 = 162.9$; $p < 0.001$). Future studies should be intentional in the recruitment of transgender/gender non-conforming and larger Latino samples to examine their association with HIV-related stigma and its effects on intersectionality. Moreover, in testing theories of intersectionality, there are an abundant number of intrinsic and extrinsic factor interactions that could possibly affect the way people experience things such as enacted HIV-related stigma; not all of which were tested in this study. More research should be conducted to explore if there are additional significant interactions among other factors as it relates to enacted HIV-related stigma. Finally, the findings of this study may not be generalizable. Though this study recruited participants from various locations covering the state of Florida, the findings may not apply to PLHIV in other states in the U.S.

Considering these limitations, our study also had important strengths. The Florida Cohort survey was conducted in nine parts of the state of Florida. Recruiting participants from various regions allows for the findings to be generalizable to an entire state and also yielded a diverse sample. Additionally, it recruited from public health clinics, federally qualified health clinics, and a food bank; which are usually not used in cohort studies. The Florida Cohort study has also built strong bonds with community partners that have made accessing participants easier, but also helps to bridge the gap between research and practice.

Conclusion

More than half of our participants reported ever experiencing enacted HIV-related stigma. Our study found that the interaction between race and ethnicity was significantly associated with enacted HIV-related stigma, where non-White Latinos had higher odds of experiencing high levels of enacted HIV-related stigma. Stigma reduction interventions should focus on this population as they bear a higher burden of enacted HIV-related stigma, but their intersecting identities may not have been reached in previous HIV-related stigma reduction interventions. The development of intervention strategies that are cognizant of intersectional identifications may improve HIV-related stigma reduction, with the final goal of improving the quality of life of PLHIV.

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Compliance with Ethical Standards

Conflict of interests The authors have no conflict of interests to report.

References

- Centers for Disease Control and Prevention. HIV surveillance report, 2017. <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2017-vol-29.pdf>. Accessed 15 Jan 2019.
- Cloete A, Simbayi LC, Kalichman SC, Strebel A, Henda N. Stigma and discrimination experiences of HIV-positive men who have sex with men in Cape Town, South Africa. *AIDS Care*. 2008;20(9):1105–10.
- Herek GM, Saha S, Burack J. Stigma and psychological distress in people with HIV/AIDS. *Basic Appl Soc Psychol*. 2013;35(1):41–54.
- Liamputtong P, editor. *Stigma, discrimination and living with HIV/AIDS: a cross-cultural perspective*. New York: Springer; 2013.
- Hatzenbuehler ML, O'cleirigh C, Mayer KH, Mimiaga MJ, Safren SA. Prospective associations between HIV-related stigma, transmission risk behaviors, and adverse mental health outcomes in men who have sex with men. *Ann Behav Med*. 2011;42(2):227–34.
- Vanable PA, Carey MP, Blair DC, Littlewood RA. Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. *AIDS Behav*. 2006;10(5):473–82.
- Varni SE, Miller CT, McCuin T, Solomon S. Disengagement and engagement coping with HIV/AIDS stigma and psychological well-being of people with HIV/AIDS. *J Soc Clin Psychol*. 2012;31(2):123–50.
- Wohl AR, Galvan FH, Carlos JA, Myers HF, Garland W, Witt MD, Cadden J, Operskalski E, Jordan W, George S. A comparison of MSM stigma, HIV stigma and depression in HIV-positive Latino and African American men who have sex with men (MSM). *AIDS Behav*. 2013;17(4):1454–64.
- Wolitski RJ, Pals SL, Kidder DP, Courtenay-Quirk C, Holtgrave DR. The effects of HIV stigma on health, disclosure of HIV status, and risk behavior of homeless and unstably housed persons living with HIV. *AIDS Behav*. 2009;13(6):1222–32.
- Logie CH, Wang Y, Lacombe-Duncan A, Wagner AC, Kaida A, Conway T, Webster K, de Pokomandy A, Loutfy MR. HIV-related stigma, racial discrimination, and gender discrimination: Pathways to physical and mental health-related quality of life among a national cohort of women living with HIV. *Prev Med*. 2018;107:36–44.
- Earnshaw VA, Lang SM, Lippitt M, Jin H, Chaudoir SR. HIV stigma and physical health symptoms: do social support, adaptive coping, and/or identity centrality act as resilience resources? *AIDS Behav*. 2015;19(1):41–9.
- Arnold EA, Rebchook GM, Kegeles SM. 'Triply cursed': racism, homophobia and HIV-related stigma are barriers to regular HIV testing, treatment adherence and disclosure among young Black gay men. *Cult Health Sex*. 2014;16(6):710–22.
- Katz IT, Ryu AE, Onuegbu AG, Psaros C, Weiser SD, Bangsberg DR, Tsai AC. Impact of HIV-related stigma on treatment adherence: systematic review and meta-synthesis. *J Int AIDS Soc*. 2013;16:18640.
- Sayles JN, Wong MD, Kinsler JJ, Martins D, Cunningham WE. The association of stigma with self-reported access to medical care and antiretroviral therapy adherence in persons living with HIV/AIDS. *J Gen Intern Med*. 2009;24(10):1101.
- Bauman LJ, Braunstein S, Calderon Y, Chhabra R, Cutler B, Leider J, Rivera A, Sclafane J, Tsoi B, Watnick D. Barriers and facilitators of linkage to HIV primary care in New York City. *J Acquir Immune Defic Syndr*. 2013;64(01):S20.
- Pollini RA, Blanco E, Crump C, Zúñiga ML. A community-based study of barriers to HIV care initiation. *AIDS Patient Care STDs*. 2011;25(10):601–9.

17. Florida Department of Health. HIV/AIDS surveillance program guides public health services. 2017. <http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/index.html>. Accessed 15 Jan 2019.
18. Turan B, Hatcher AM, Weiser SD, Johnson MO, Rice WS, Turan JM. Framing mechanisms linking HIV-related stigma, adherence to treatment, and health outcomes. *Am J Public Health*. 2017;107(6):863–9.
19. Lovato LV. Intersectionality of identity and HIV-related stigma. Doctoral dissertation, The University of North Carolina at Charlotte.
20. Purdie-Vaughns V, Eibach RP. Intersectional invisibility: the distinctive advantages and disadvantages of multiple subordinate-group identities. *Sex Roles*. 2008;59(5–6):377–91.
21. Dubrow JK. How can we account for intersectionality in quantitative analysis of survey data? Empirical illustration for Central and Eastern Europe. *Res Methods*. 2008;17:85–100.
22. Bowleg L. When Black + lesbian + woman ≠ Black lesbian woman: the methodological challenges of qualitative and quantitative intersectionality research. *Sex Roles*. 2008;59(5–6):312–25.
23. Loutfy MR, Logie CH, Zhang Y, Blitz SL, Margolese SL, Tharao WE, Rourke SB, Rueda S, Raboud JM. Gender and ethnicity differences in HIV-related stigma experienced by people living with HIV in Ontario, Canada. *PLoS ONE*. 2012;7(12):e48168.
24. Mays VM, Cochran SD. Mental health correlates of perceived discrimination among lesbian, gay, and bisexual adults in the United States. *Am J Public Health*. 2001;91(11):1869–76.
25. Semple SJ, Strathdee SA, Zians J, Patterson TL. Factors associated with experiences of stigma in a sample of HIV-positive, methamphetamine-using men who have sex with men. *Drug Alcohol Depend*. 2012;125(1–2):154–9.
26. Young M, Stuber J, Ahern J, Galea S. Interpersonal discrimination and the health of illicit drug users. *Am J Drug Alcohol Abuse*. 2005;31(3):371–91.
27. Caiola C, Docherty S, Relf M, Barroso J. Using an intersectional approach to study the impact of social determinants of health for African-American mothers living with HIV. *Adv Nurs Sci*. 2014;37(4):287.
28. Collins PY, von Unger H, Armbrister A. Church ladies, good girls, and locas: stigma and the intersection of gender, ethnicity, mental illness, and sexuality in relation to HIV risk. *Soc Sci Med*. 2008;67(3):389–97.
29. Earnshaw VA, Bogart LM, Dovidio JF, Williams DR. Stigma and racial/ethnic HIV disparities: moving toward resilience. *Am Psychol*. 2015;68(4):60.
30. Simien EM. Doing intersectionality research: from conceptual issues to practical examples. *Politics Gend*. 2007;3(2):264–71.
31. Logie C, James L, Tharao W, Loutfy M. Associations between HIV-related stigma, racial discrimination, gender discrimination, and depression among HIV-positive African, Caribbean, and Black women in Ontario, Canada. *AIDS Patient Care STDs*. 2013;27(2):114–22.
32. Florida Department of Health (FDOH). State of Florida Integrated HIV Prevention and Care Plan 2017–2021; 2016. http://aidsnet.org/wp-content/uploads/2016/11/State-of-Florida-Integrated-HIV-Prevention-and-Care-Plan-09-29-16_FINAL-Combined.pdf. Accessed 15 Jan 2019.
33. National Institute of Health (NIH). RFA-MH-19-412: promoting reductions in intersectional StigMa (PRISM) to improve the HIV prevention continuum (R01 clinical trial optional). 2018.
34. Lucero RJ, Frimpong JA, Fehlberg EA, Bjarnadottir RI, Weaver MT, Cook C, Modave F, Rathore MH, Morano JP, Ibanez G, Cook RL. The relationship between individual characteristics and interest in using a mobile phone app for HIV self-management: observational cohort study of people living with HIV. *JMIR mHealth uHealth*. 2017;5(7):e100.
35. Sharpe JD, Zhou Z, Escobar-Viera CG, Morano JP, Lucero RJ, Ibañez GE, Hart M, Cook CL, Cook RL. Interest in using mobile technology to help self-manage alcohol use among persons living with the human immunodeficiency virus: a Florida Cohort cross-sectional study. *Subst Abuse*. 2018;39(1):77–82.
36. Rueda S, Mitra S, Chen S, Gogolishvili D, Globerman J, Chambers L, Wilson M, Logie CH, Shi Q, Morassaei S, Rourke SB. Examining the associations between HIV-related stigma and health outcomes in people living with HIV/AIDS: a series of meta-analyses. *BMJ Open*. 2016;6(7):e011453.
37. Sherbourne CD, Stewart AL. The MOS social support survey. *Soc Sci Med*. 1991;32(6):705–14.
38. Sheehan D, Trepka M, Fennie K, Prado G, Cano M, Maddox L. Black-White Latino racial disparities in HIV survival, Florida, 2000–2011. *Int J Environ Res Public Health*. 2016;13(1):9.
39. López G, Gonzalez-Barrera A. Afro-latino: a deeply rooted identity among US hispanics. Washington, DC: Pew Research Center; 2016.
40. Florida Department of Health. HIV/AIDS Epidemiologic Profile: Florida, 2017. 2018. <http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/epi-profiles/index.html>. Accessed 15 Jan 2019.
41. Cuevas AG, Dawson BA, Williams DR. Race and skin color in Latino health: an analytic review. *Am J Public Health*. 2016;106(12):2131–6.
42. Garcia JA, Sanchez GR, Sanchez-Youngman S, Vargas ED, Ybarra VD. Race as lived experience: the impact of multi-dimensional measures of race/ethnicity on the self-reported health status of Latinos. *Du Bois Rev*. 2015;12(2):349–73.
43. Chavez-Dueñas NY, Adames HY, Organista KC. Skin-color prejudice and within-group racial discrimination: historical and current impact on Latino/a populations. *Hisp J Behav Sci*. 2014;36(1):3–26.
44. Florida Department of Health. HIV prevention program launches new statewide minority media campaign. 2017. <http://www.floridahealth.gov/diseases-and-conditions/aids/>. Accessed 15 Jan 2019.
45. Kerr JC, Valois RF, DiClemente RJ, Carey MP, Stanton B, Romer D, Fletcher F, Farber N, Brown LK, Vanable PA, Salazar LF. The effects of a mass media HIV-risk reduction strategy on HIV-related stigma and knowledge among African American adolescents. *AIDS Patient Care STDs*. 2015;29(3):150–6.
46. LaVeist-Ramos TA, Galarraga J, Thorpe RJ, Bell CN, Austin CJ. Are black Hispanics black or Hispanic? Exploring disparities at the intersection of race and ethnicity. *J Epidemiol Community Health*. 2012;66(7):e21.
47. Washington Post. Survey of Americans on HIV/AIDS. Kaiser family foundation. 2012. <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8334-f.pdf>. Accessed 15 Jan 2019.
48. Darlington CK, Hutson SP. Understanding HIV-related stigma among women in the Southern United States: a literature review. *AIDS Behav*. 2017;21(1):12–26.
49. Melton ML. Sex, lies, and stereotypes: HIV positive black women's perspectives on HIV stigma and the need for public policy as HIV/AIDS prevention intervention. *Race Gend Class*. 2011;18:295–313.
50. Moneyham L, Seals B, Demi A, Sowell R, Cohen L, Guillory J. Perceptions of stigma in women infected with HIV. *AIDS Patient Care STDs*. 1996;10(3):162–7.
51. Vyavaharkar MV, Moneyham L, Corwin S. Health care utilization: the experiences of rural HIV-positive African American women. *J Health Care Poor Underserved*. 2008;19(1):294–306.
52. Sengupta S, Banks B, Jonas D, Miles MS, Smith GC. HIV interventions to reduce HIV/AIDS stigma: a systematic review. *AIDS Behav*. 2011;15(6):1075–87.

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