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Author

Taylor, Keyanna Paulean Jeanette

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A thesis submitted in partial satisfaction of the requirements for the degree Master of Science in Epidemiology

by

Keyanna Paulean Jeanette Taylor

2024

ABSTRACT OF THE THESIS

LifeSkills Mobile Ancillary Study: Examining Multilevel and Intersectional Stigma and HIV Risk among Young Trans Femmes in the U.S.

by

Keyanna Paulean Jeanette Taylor

Master of Science in Epidemiology

University of California, Los Angeles, 2024

Professor Matthew James Mimiaga, Chair

Transgender women, especially young transgender women of color, are disproportionately affected by HIV in the United States. Many interpersonal and structural factors such as discrimination, employment and housing instability, increased substance use and poor mental health, and limited affirming healthcare access have created barriers to adequate prevention methods, timely diagnosis of HIV, and HIV engagement and retention in care. State-level policies related to race and gender identity often influence interpersonal and structural barriers to HIV prevention and care and warrant further investigation. Therefore, the objective of this analysis is to examine the relationship between experiences of race- and gender-related stigma at the interpersonal and structural levels, and HIV risk among young adult, ages 16-29 years old, trans women and trans femmes in the United States. To achieve this objective, a multilevel modeling approach using a quantitative intersectional analytic framework is proposed.

The thesis of Keyanna Paulean Jeanette Taylor is approved.

Ilan H. Meyer

Roger Detels

Matthew James Mimiaga, Committee Chair

University of California, Los Angeles

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TABLE OF CONTENTS

Chapter 1: Introduction

Burden of Disease

In the United States, transgender women – persons assigned male sex at birth who identify as women or transgender women – are disproportionately affected by HIV.[1] A 2021 report by the Centers for Disease Control and Prevention (CDC) found that among 1,608 transgender women from 7 major U.S. cities, 42% had HIV.[1] Additionally, the report found stark ethnic and racial differences with 42% and 35% of Black and Hispanic transgender women having HIV, respectively, compared to only 17% of white transgender women.[1]

Determinants of Disease

It has been well documented that interpersonal and structural racism and transphobia (stigma related to one's race or gender identity) potentiate HIV transmission among transgender women in the Unites States by directly impacting housing stability, employment, health care access and utilization, police discrimination and incarceration, social support, and access to social services.[2-7] For example, rates of homelessness among transgender individuals in the U.S. are twice those among the general population, often resulting from family estrangement and housing and employment discrimination.[8] These socioeconomic challenges predispose transgender women to engagement in sex work, poor mental health, and substance use, which are associated with sexual risk behavior and HIV infection.[9-10] Additionally, socioeconomic marginalization hinders access to pre-exposure prophylaxis, a biomedical intervention that when taken as prescribed, can reduce the risk of HIV transmission.[11-13] Studies have found that PrEP uptake among Black and Hispanic transgender women remains low due to multiple structural barriers such as employment, transportation, housing insecurity, community stigma, and negative experiences in healthcare.[13-15]

Many determinants of HIV risk among transwomen are influenced by policies related to transgender or gender diverse (TGD) people, which have been increasing over the past decade at the state and federal levels.[7,16-17] Such policies can either be restrictive or protective in nature and have paramount implications for the health and wellbeing of TGD individuals.[18-20] Policies impacting TGD folks can often impact one's access to healthcare, health insurance, affordable housing, employment, and social environment – whether it be accepting or stigmatizing.[18-20] Previous studies have found that TGD individuals living in environments with more protective TGD-specific policies reported better mental health, less alcohol use, less time since their last routine health care checkup, and increased use of medical gender affirmation services.[18,21]

Intersectionality

The intersectionality analytical framework is a powerful tool can be utilized to address the HIV epidemic among transgender women, which is underpinned by structural inequities.[22] The intersectionality analytical framework supplies a means to examine complexities in health disparities among historically marginalized groups and subsequently informs health practitioners and systems of the most vulnerable communities and their needs in terms of prevention and treatment services.[22-23.]

In recent years, scholars have analyzed intersectionality in qualitative and quantitative studies. Qualitative studies often examine the phenomenological experiences of groups with intersecting social identities and provide a comprehensive picture of lived experiences of intersection.[24] Qualitative studies have highlighted the importance of exploring the health of historically oppressed or disadvantaged groups.[25] However, quantitative studies often analyze intersectionality by typically examining social identities as categorical predictors to explain various outcomes.[24] There remains a lack of quantitative studies scientifically validating

intersectionality; therefore, scholars recommend that intersectionality be assessed quantitatively to advance scientific understanding of the unique lived experiences of intersecting identities.[22, 24-25]

However, uncertainty remains about the best methods to analyze intersectionality quantitatively.[26-27] It has been recommended that research utilizing an intersectional analytical framework aim to ensure fidelity of the original focus of intersectionality which involves power and interlocking systems of oppression.[22] Therefore, studies should examine intersections of various social processes such as experiences of sexism, heterosexism, and racism, instead of social identities of gender, sexual orientation, and race/ethnicity.[23-24] Focusing on social processes instead of social identities, allows researchers to examine the effects systems of oppression at the individual and population level.[23]

Existing Evidence

Few studies have examined the relationship between multilevel stigma and HIV risk among transgender women of color. One analysis by Arayasirikul and authors, which examined the relationship between transphobic discrimination and HIV risk, found that trans women of color had greater odds of condomless receptive anal intercourse (CRAI) compared to white transwomen.[28] However, the authors did not include racial discrimination in their analysis.[28] In another study, Wesson and authors examined differences in HIV prevalence and experiences of discrimination. [30] They utilized a quantitative intersectional approach and found that trans women of color reported fewer experiences of discrimination; however, they note that this may be due to underreporting of discrimination among trans women of color.[30]

In summary, transgender women of color have unique experiences related to their various intersecting identities such as race, gender, education and income, and ability status to name a

few. In order to end disparities in HIV infection among this population, it is important to examine the intersecting social marginalization of race and gender identity that transgender women of color experience.[29] Once we have a better understanding of the intersectionality of these factors and how they potentiate HIV risk, we will be better equipped to develop interventions to improve sexual health and wellbeing for this group. Therefore, the objective of this analysis is to examine the relationship between experiences of race- and gender-related stigma at the interpersonal and structural levels, and HIV risk among trans women using a quantitative intersectional approach.

Chapter 2: Materials and Methods

Study Design

The present study is a cross-sectional quantitative analysis of primary and secondary data. This study is ancillary to the LifeSkills Mobile study, a NIH funded multisite randomized controlled efficacy trial with a repeated measures design. The goal of the parent study is to investigate the efficacy of the LifeSkills Mobile app-based intervention on HIV incidence in comparison to the standard of care prevention (SOC) condition among a large cohort (N = 5,000) of young transgender women (YTW) across the US. The study population includes YTW, ages 16-29, who are at risk for HIV infection in the U.S. Participants in the trial are recruited online or from community-based organizations on a rolling basis over 4 years. Enrolled participants are asked to complete at home HIV tests and surveys every 6 months for up to 48 months.

Participants

Participants for the present study were recruited from the parent study via email and text message promotion. To be eligible, participants must be: 1) currently enrolled in the parent study, and 2) have previously consented to be contacted regarding future research studies. To be eligible

for the parent study participants must: 1) be between 16 and 29 years old; 2) live in the U.S.; 3) be sexually active; 4) have access to a smartphone or computer; 5) be able to speak and read English; 6) be HIV-negative or have an unknown HIV status; and 7) identify as a trans woman or trans femme with a male sex designated at birth.

Measures

The independent variables in this analysis are transphobia and racism measured at the interpersonal and structural level. The dependent variable, or primary outcome of interest, is HIV risk. Additional covariates included sociodemographic factors such as age, employment status, housing status, educational attainment, income, and psychosocial factors such as mental health symptoms and substance use. Upon recruitment from the parent study, participants completed a short survey which contained the interpersonal stigma items along with identifier items such as name, email address, phone number, and date of birth to allow for matching participants to their parent study baseline data. HIV risk and additional individual-level covariates were collected from participants baseline survey. All variables are described in Table 1.

Interpersonal transphobia and racism were operationalized as stigma related to one's gender identity or race and/or ethnicity, respectively. Interpersonal stigma related to gender identity and race/ethnicity was measured with the Everyday Discrimination Scale, a quantitative survey with 9-items that assess experiences of day-to-day enacted discrimination and allows the participant to indicate the believed reason for these experiences.[31] Items are answered on a six-point scale of (0) never, (1) less than once a year, (2) a few times a year, (3) a few times a month, (4) at least once a week, and (5) almost every day. Responses to these five items were summed for a possible score from 0 to 25, with higher scores indicating more experiences of discrimination. For this analysis, interpersonal racism was a continuous sum of any items where

the participant lists a perceived reason for said discrimination to be either race and/or ethnicity. Similarly, interpersonal transphobia was continuous sum of any items where the participant lists a perceived reason for said discrimination to be gender identity.

Structural transphobia was operationalized as gender-identity equality at the state level. Gender-identity equality was measured using a composite score of various state level policies pertaining to gender identity. Previous studies have utilized similar methods to operationalize structural stigma for transgender folks by creating summary index measures that score specific state policies based on their protections or restrictions for transgender health and wellbeing.[19-21]

Data was collected from the Movement Advancement Project (MAP), a publicly available data source that tracks over 50 different laws and policies within each state that explicitly address or impact gender identity and/or expression. The major categories of laws covered by the policy tally include: Relationship & Parental Recognition, Nondiscrimination, Religious Exemptions, LGBTQ Youth, Health Care, Criminal Justice, and Identity Documents.[32] For each policy, MAP assigns a score or point value, and then adds these scores to create a "policy tally" for each state. A state's total possible tally score ranges from -30.5 to +44.5. Harmful or discriminatory policies earn negative points or point deductions, while inclusive or protective laws earn positive points.[32] Fractions of a point may be awarded for states that have enacted a portion of a law, or in cases where local laws provide some protection but do not cover the entire state population.[32] States are also categorized as "negative," "low," "fair," "medium," or "high," based on their tally score relative to the total tally points possible.[32] Data available from Movement Advancement Project was last updated October 2023.

Structural racism was operationalized as racial equity at the state level, measured using the Racial Equity Index (REI), a ranking that offers a comparative snapshot of racial equity for

US cities, regions, and states.[33] The REI is a comprehensive metric collected from the National Equity Atlas, a publicly available data and policy tool produced by PolicyLink and the USC Equity Research Institute.[33]

The Racial Equity Index (REI) assesses geographic areas using nine equity indicators. Each indicator is translated into inclusion values ranging from 1 to 100, with 100 indicating the highest racial inclusivity. [33] These scores are combined to form the inclusion score. Additionally, each indicator is converted into prosperity values, also ranging from 1 to 100, with 100 representing the most positive overall outcomes. [33] The composite prosperity value is calculated for the entire population, resulting in a prosperity score. [33] Finally, the prosperity score and inclusion score are averaged to derive the REI, reflecting overall population outcomes and racial/ethnic inclusion. [33] The indicators used include median wages, unemployment, poverty, educational attainment, disconnected youth, school poverty, air pollution exposure, commute time, and rent burden. [33] Data available from the National Equity Atlas was last updated July 2020.

HIV risk was measured as the number of distinct condomless receptive or insertive anal and/or vaginal sex acts without protection of PrEP. This data was collected from the parent study baseline survey. In the parent study, PrEP use was verified with rapid urine tenofovir test strips at enrollment for all participants who stated they were currently taking PrEP.

Table 1. Description of Study Variables

Variable	Measurement
Independent/Predictor Variables	
Interpersonal racism	Summary score of discrimination items where the participant believed the discrimination was due to their race and/or ethnicity. Measured using the Everyday Discrimination Scale[31] (continuous)
Interpersonal transphobia	Summary score of discrimination items where the participant believed the discrimination was due to their gender identity. Measured using the Everyday Discrimination Scale[31] (continuous)
Structural racism	Racial Equity Index state rank (continuous)
Structural transphobia	Gender identity state policy score (continuous)
Dependent/Outcome Variable	
HIV risk	Number of distinct receptive or insertive condomless anal or vaginal sex acts in the past 30 days, assessed at baseline (continuous)
Individual-level Covariates	
Age	Calculated from "What is your data of birth?"
Race/Ethnicity	"What do you consider to be your primary race or ethnic background?"
Gender identity	"How do you self-identify in terms of gender (check all that apply)?"
Sexual orientation	"How do you describe your sexual identity (check all that apply)?"
State of residence	Calculated from "What is your zip code where you currently live?"
Employment status	"Are you currently employed?"
Housing stability	"What best describes where you live right now?"
Educational attainment	"What is your highest level of education?"
Income	"What was your household income over the last 12-months from all sources before taxes?"
PrEP use	"Have you taken PrEP at all in the last 30 days?"
Depression	Summary score from the Short Depression Scale (CES-D)[36]
Anxiety	Summary score from the General Anxiety Disorder (GAD-7)[37]
Substance use	Summary score from the Alcohol, Smoking, And Substance Involvement Screening Test (ASSIST)[38]

Data Analysis Plan and Power Analysis

Data will be analyzed with multilevel modeling, which can provide a novel and alternative approach to examining health disparities at the intersection of social identities or processes. Multilevel models are particularly appropriate for research designs where data for participants are organized at more than one level (i.e., nested data). The units of analysis are individuals (at a lower level) who are nested within contextual/aggregate units (at a higher level/structural levels). Using multilevel modeling has been recommended by various scholars conducting similar analyses using an intersectional framework in social epidemiology.[34-35]

For this analysis, level 1 (low level) is the individual level. Level 2 (high level) are the state-level social processes of structural racism and transphobia, operationalized as the racial equity index and gender-identity policy score. Individual participants are nested within states, therefore, individuals in each state share the same values for structural racism and transphobia. Individual-level covariates will include: interpersonal gender- and race-related discrimination, and other sociodemographic and/or psychosocial factors, to be determined upon model specification.

All analyses will use two-tailed tests of significance, with significance at alpha = 0.05. Similarly to previous studies, multiple hierarchical random effects models with maximum likelihood estimation will be fit. Three sets of models will be fit and tested, one for examining transphobia alone, one for examining racism alone, and one with interactions between racism and transphobia.[35,43-44] Based on a conducted power analysis, a sample size of 300 will provide greater than 85% power to determine a moderate effect. Models will be specified with SAS 9.4 (cite) using the PROC MIXED procedure for multilevel models.[45]

Ethical approval

Human subjects research was approved by the University of California, Los Angeles institutional review board, IRB#23-001019.

Chapter 3: Discussion

The results of this study should be considered in light of multiple potential limitations. Firstly, the use of gender identity and racial equity policies to measure structural racism and transphobia is a novel and non-validated method. While previous studies have conducted similar analyses, significant uncertainty remains as to whether these are the best measurements for such complex social processes and/or phenomena. The Racial Equity Index and gender identity policy score were both developed with a comprehensive list of policy indicators; however, these scores only consider existing laws and do not consider social climate, local level progress on certain protections, the actual implementation of each state law. It is possible that there are better suited metrics for capturing race-and/or gender-related discrimination and stigma. Further research is needed to develop comprehensive and valid measures for structural stigma to subsequently examine the public health impacts of racism, transphobia, and other structural social processes. Additionally, the state level data utilized in this analysis is not all current. The racial equity data last updated through July 2020 while the gender identity policy data was updated as recently as October 2023.

Secondly, the outcome of interest in this analysis was HIV risk and was only measured as the distinct number of insertive or receptive unprotected anal or vaginal sex acts. This measure did not consider other HIV transmission modes such as injection drug use. It is possible that other, more comprehensive, measures are more appropriate for quantifying and summarizing one's risk for acquiring HIV.

Additionally, a potential limitation is that the final models selected in this analysis were poorly fit or underpowered. Multilevel modeling has been utilized in social epidemiology, for example, to study structural/institutional racism in the context of overall health status, air pollution exposure, mortality risk, and other health inequities.[39-42] And more specifically, scholars are recommending the use of multilevel models over traditional regression models specifically for analyzing intersectionality, due to them having greater model parsimony, which is recommended as our number of dimensions/social strata under investigation increases.[35,43-44] However, multilevel model specification is complex and requires us to deeply investigate the practical implications behind the empirical analyses. Analytic decisions in model building such as determining dimensions, additive parameters, the use of interaction terms, or determining fixed or random effects, will impact the interpretability of our results. These are important considerations when employing multilevel models to examine intersectionality, or utilize an intersectionality framework, with fidelity and in an interpretable manner.

Lastly, in the parent trial, LifeSkills Mobile, participants were not sampled probabilistically. Therefore, the study sample for this analysis is not representative of all young trans women and trans femmes in the US, impacting the overall generalizability of these results.

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