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# Discrimination and HIV Physical Health among Young HIV-Positive Black Men who have Sex with Men

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# Discrimination and HIV Physical Health among Young HIV-Positive Black Men who have Sex with Men

By

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B.S. The College of William & Mary, 2014

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An abstract of
A thesis submitted to the Faculty of the
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## Abstract


### Discrimination and HIV Physical Health among Young HIV-Positive Black Men who have Sex with Men

**By Ruth Dana**

**Objective:** We examined associations between perceived discrimination and HIV physical health outcomes including CD4+ T cell count and HIV viral load among HIV-positive, young, black, men who have sex with men in Atlanta, GA.

**Methods:** Data were derived from the Ele[men]t study, a cohort of black MSM aged 18-29 years in Atlanta, GA. Participants were 164 HIV-positive MSM who completed computer-assisted self-interviews, HIV counseling and testing, and laboratory testing. Discrimination was assessed by the Everyday Discrimination Scale and the Major Experiences of Discrimination Scale. We employed logistic and ordinal regression to examine links between discrimination and viral suppression as well as disease progression based on CD4 count.

**Results:** Scoring highest on major experiences of discrimination was associated with having a detectable viral load compared with those not reporting discrimination, when controlling for current HIV medication and income (OR = 3.53, 95% CI = 1.14, 11.02). Clear trends did not emerge for other measures of discrimination and for disease progression.

**Conclusion:** Findings suggest a complicated relationship between perceived discrimination and HIV health, but that discrimination does play a role in viral suppression. Future study should include examinations of discrimination at structural and internal levels as well as mediating factors such as resilience and stress related growth. Additionally, socio-economic status should be carefully considered as a social determinant of health for its differential functioning among certain minority groups.

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## Introduction

The HIV epidemic in the United States continues to disproportionately affect men who have sex with men (MSM), and especially African-American/black MSM (1). Although black individuals comprise only 13.3% of the U.S. population (2) and MSM only 3.9% (3), black MSM accounted for 26.1% of all new HIV diagnoses in 2015. Black MSM represent 39.1% of all new HIV diagnoses among all MSM and 58.4% among all blacks (4). Black MSM have been shown to have even greater rates of HIV diagnosis -- 6 times as great as rates for white MSM (3, 5). Black MSM have also been shown to be more likely to progress to AIDS within 3 years of HIV diagnosis and have high mortality rates (5). Studies suggest that compared with white MSM, black MSM have delays in HIV diagnosis, are less likely to be linked to HIV care, have lower medication adherence, lower CD4 counts, and higher viral loads. These care continuum gaps not only contribute to disease progression and mortality, but also play a role in transmission involving HIV infection awareness and anti-retroviral treatment (ART) (5-9).

Discrimination, including racism, homophobia, and HIV-related stigma, might contribute to the increased burden of HIV among young black MSM (YBMSM). The links between discrimination and health outcomes are not limited to HIV: there is extensive evidence linking discrimination to depression, hypertension, breast cancer, and preterm and low-birthweight deliveries (10-13). For those living with HIV this has not been as extensively studied, but there is evidence linking discrimination to HIV outcomes including CD4 count, viral load, ART non-adherence, HIV testing, and risk behaviors (14-16).

In accordance with the socio-ecological model, being a member of multiple marginalized groups such as black, HIV-positive MSM can affect individual health (17). Similarly, discrimination has been described as having three interrelated levels: institutional, personally mediated, and internalized (18). Institutional discrimination represents socio-economic differences and systemic differences in healthcare access, resulting in lower levels of health insurance coverage among HIV-positive black MSM compared to HIV-positive MSM of other races (16). Perceived discrimination affects individuals psychologically, behaviorally, and physiologically producing the aforementioned health outcomes (12).

Personally mediated discrimination, including racism, homophobia, and discrimination based on HIV-positivity, affects delivery of individual health care and acts as a form of chronic stress (11). Stress has consistently been found to affect the immune system (19), and specifically, among HIV-negative older adults, psychosocial stress has been shown to decrease CD4 cell counts and increase CD8 counts (20). Stress caused by discrimination has not been well explored for HIV related immune outcomes, but racial discrimination has been associated with lower CD4 count, detectable viral load, and greater likelihood of emergency room visits among black, HIV-positive MSM (14).

Finally, internalized discrimination represents self-accepted stigma and results in changes in health behaviors. Elevated HIV risk for black MSM has not been explained by risk behaviors such as number of sex partners, frequency of unprotected anal intercourse, substance use, or disclosure of sexuality (7, 9, 21, 22). In a recent review,

black MSM were actually more likely to report preventive behavior (9), although black MSM might also be more likely to under-report stigmatized behaviors (23, 24). However, discrimination has been linked to poor ART medication adherence, which may contribute to worse treatment outcomes (15, 16).

We aim to examine perceived discrimination measured by the Everyday Discrimination Scale (EDS) (25) and the Major Experiences of Discrimination (MEOD) (26) and corresponding effects on CD4 count and undetectable viral load among a group of HIV-positive, young, black MSM from Atlanta, GA. These two measures of discrimination were considered separately and in combination in relation to health outcomes and other correlates.

## Methods

### Participants

We analyzed data from the Ele[men]t study, a cohort of young, black MSM conducted in Atlanta, Georgia (27). From July 2015 to June 2017, 465 YBMSM were enrolled in the study. One participant was improperly enrolled and excluded from analysis. Of those properly enrolled, 164 tested HIV positive at baseline and were included in this analysis. Eligible participants were cis-gender males who self-identified single race black/African-American and non-Hispanic ethnicity, were 18-29 years of age, reported sex with another man in the previous 3 months, lived and planned to remain in Atlanta for 2 years, could complete the survey in English, could provide 2 alternate contacts, and were not otherwise enrolled in an HIV prevention trial. This study was approved by the Emory University Institutional Review Board.

### Procedure

Participants were recruited in Atlanta, Georgia, in person, on the internet, through peer referral, and phone calls. Individuals were screened initially and again in person at their enrollment visit before obtaining written informed consent. Data collection at this visit included a survey, HIV counseling and rapid testing including a short questionnaire administered by HIV counselors, and additional laboratory testing. All participants were screened for HIV with rapid testing and those with preliminary positive results received additional counseling and those not already in HIV care were linked to care. Confirmatory HIV tests were conducted using 4$^{th}$ generation HIV testing, CD4 count, and viral load. For those screening HIV negative, the more sensitive nucleic

acid testing (NAT) was performed. Additional testing for Hepatitis B and C, gonorrhea, chlamydia, and syphilis were performed and participants were notified of results.

The computer-assisted self-interview (CASI) questionnaire was administered at the initial study visit following HIV counseling but prior to receipt of HIV rapid test results. The survey collected information on demographics, prior HIV testing, HIV care, and experiences of discrimination. Survey data were stored in secure HIPAA-compliant servers. Participants were compensated $100 for their baseline visit.

**Measures and Coded Variables**

This report considers baseline data for HIV positive participants, including demographics, CD4 count and viral load, discrimination measured on two scales, and awareness of HIV status. Demographics were assessed with standard questions regarding income and education; age was calculated from date of birth on identification presented at enrollment.

CD4 count was assessed using flow cytometry and viral load was assessed using Abbott RealTime HIV-1 Assay. CD4 count was categorized as <200 cells/µL, 200-499 cells/µL, or ≥500 cells/µL to represent varying stages of disease progression. Viral load was considered a dichotomous variable with either undetectable (<40 copies/mL) or detectable (≥40 copies/mL).

Participant experiences of discrimination were assessed using two scales, including the Everyday Discrimination Scale (25) which focuses on day-to-day discrimination and the Major Experiences of Discrimination (26) which focuses on discrimination events across the life-course. EDS scale items measure how often

experiences happen (e.g. “You are treated with less respect than other people are.”) with responses ranging from “almost everyday” to “never”. The scale consists of 9 items with scores ranging 0-5 which are summed for a maximum score of 45. Participants missing one (n=5) or two (n=1) scale items were summed based on the completed portion of the scale, and those missing the whole scale were censored (n=1). The aggregate EDS score was considered in quartiles (Q1: 0, Q2: 1-8, Q3: 9-17, Q4: 18-45).

The MEOD scale consists of 6 items which describe experiences of mistreatment (e.g. “For unfair reasons, have you ever not been hired for a job?”) which respondents answered yes or no, coded as 1 and 0, respectively. Scale items were summed with scores ranging 0-6 and considered categorically with 4 levels (0,1, 2, 3+ scores).

EDS and MEOD were considered together for a combined discrimination score which was dichotomized and considered present if discrimination was reported on either EDS or MEOD. If any discrimination was reported, participants could select the main reason for these experiences (e.g. your gender, your race, your sexual orientation, your height, or other).

Income was dichotomized at <$20,000 annually or ≥$20,000 annually and education was dichotomized as some college or higher or high school diploma/GED or less. HIV treatment status was assessed via self-report. Participants were considered to be aware of HIV status if they reported previously knowing they were HIV-positive during counseling, on the survey, following delivery of test results, or had an undetectable viral load.

**Data Analysis**

Bivariate analyses were conducted using $\chi^2$ statistics, including Fisher's exact test when appropriate, and Wilcoxon rank sum tests for EDS distribution. Logistic regression models were used to assess the association of viral load with the different measures of discrimination, which were controlled for income and current medication. Ordinal models were used to assess links between discrimination and disease progression represented by the three level CD4 count categories and were also controlled for income and current medication. Proportional odds assumptions were met for disease progression through CD4 count categories for all models. Control variables were selected based on a theoretical framework developed through directed acyclic graphs (Figure 1). Based on this framework, socio-economic status was controlled for via income and known HIV status via current medication variables. Age and race/ethnicity were restricted in this study and thus not eligible to be included in the model. Variables such as employment, medical mistrust, and health behaviors were considered to be intervening variables and thus not controlled for. Analyses were conducted with SAS 9.4 (SAS Institute, Cary, NC).

## Results

### Participant Characteristics

Participant characteristics are presented in Table 1. Participant age ranged from 19-29 years old, with an average of 25.9. Most had at least some college education, income less than $20,000/year, identified as gay/homosexual, were currently on HIV medication, and were aware of their HIV status.

Select characteristics for those testing positive and negative at baseline are described in Table 2, where 464 individuals were enrolled, of which 164 (35%) tested positive for HIV. Viral load and CD4+ T cell counts were obtained for 160 (98%) participants. Testing positive for HIV was associated with older age, lower education levels, lower income, and less reported discrimination on the Everyday Discrimination Score. Scores from the Major Experiences of Discrimination Scale did not differ significantly between the two groups.

### HIV Physical Health Outcomes

Out of the 164 who tested positive, viral load was obtained for 160 participants, of which 89 (56%) had detectable viral loads. Having a detectable VL was associated with lower education, lower income, not currently taking HIV medication, and being unaware of HIV status (Table 3). Of those who had CD4 counts available, 17 (11%) had counts <200 cells/µL, 58 (36%) had counts between 200-499 cells/µL, and 85 (53%) had counts ≥500 cells/µL. Lower income and not currently taking HIV medication were significantly associated with HIV CD4 count (Table 4).

### Discrimination

Discrimination scales were assessed and found to have high internal validity in this population for both the EDS (Cronbach's alpha = 0.92) and MEOD (Cronbach's alpha = 0.67). When considering both scales together, 25 participants (15%) did not report any discrimination. Scores on both scales spanned from the minimum score, 0 on both, to the maximum score, 45 for EDS and 6 for MEOD (Figures 2 and 3). Distributions were right skewed with a median value of 8 for EDS and 1 for MEOD.

Among the 164 HIV-positive participants, the most commonly reported lifetime major discriminatory events were being unfairly fired/denied a promotion (40%) and treated unfairly by police (33%). Among those reporting any discrimination, the most common main reason for discriminatory experiences cited were race (28%), sexual orientation (28%), and physical appearance (9%).

**Reported Discrimination as Predictors of Detectable Viral Load**

Participants reporting the most discrimination on the MEOD had higher odds of a detectable viral load (OR = 3.54, p = 0.03) compared with those not reporting any discrimination. When examining individual scale items, significant harmful effects were observed for unfairly being fired/denied a promotion (OR = 2.85, 95% CI: 1.27, 6.38) and housing discrimination (OR = 3.98, 95% CI: 1.07, 14.78) while controlling for income and current medication. Other MEOD scale items had point estimates in the same direction but did not have significant associations.

Combined discrimination did not present significant associations with viral load. Considering the discrimination exposure as EDS quartiles did not yield significant associations and had inconsistent results in terms of direction of effect. Low and high

discrimination appeared harmful for viral suppression but medium discrimination displayed greater viral suppression than those not experiencing any discrimination.

**Reported Discrimination as Predictors of Disease Progression**

When considering CD4 count category as a proxy for disease progression, none of the reported discrimination measures significantly predicted HIV disease progression. Participants reporting any discrimination had lower odds of having lower CD4 cell counts at the study visit (OR = 0.81, 95% CI: 0.38, 1.73), but the association was non-significant. (p = 0.38). Among the EDS scale, the highest quartile of discrimination saw non-significant protective effects for disease progression when compared with those reporting no discrimination. However, using the MEOD scale, harmful effects for disease progression were observed for the participants scoring highest in discrimination.

## Discussion

Links between perceived discrimination and HIV physical health were assessed to examine the effects of discrimination on outcomes for HIV-positive YBMSM. As a known determinant of health behaviors and both mental and physical health, discrimination is an important facet to consider when seeking to explain undue burden of HIV infection and disease progression among this population (14-16). Race-, sexual orientation-, and HIV-related stigma were considered in concert for these individuals who are at multiple intersections of marginalized identity; other investigators have examined these factors separately (14, 28). Everyday hassles (assessed with EDS) are typically considered to be less disruptive individually compared with major life events (assessed with MEOD), thus we only considered EDS items together whereas MEOD was found to have significant effects for particular domains considered individually (29, 30).

The relationship between viral load and discrimination was observed to differ based on which measure discrimination was used as an exposure, with significant effects for increases in discrimination based on MEOD but not EDS or the combined score. Consistent with previous research (14), our results demonstrated that increasing major life event discrimination was associated with increasingly worse odds for having an undetectable viral load among YBMSM living with HIV. Notably, lack of viral suppression was linked specifically with having been unfairly fired or denied a promotion and housing discrimination events. This relationship did not hold true when considering everyday discrimination, which had inconsistent direction of effects on viral suppression.

Associations between discrimination and CD4 count category as a proxy for HIV disease progression were unclear, potentially due to many longitudinal factors affecting CD4 count, such as date of seroconversion, duration of treatment, demographics, or other (31-33), which could not be accounted for in the model for this cross-sectional sample. The inclusion of newly diagnosed individuals may have further complicated this relationship, although odds ratios were adjusted for current medication as a proxy for HIV status awareness to(31) account for this.

The differing effects between survey measures observed may be due in part to the distinct function of everyday stressors versus major life events(29). Day-to-day discrimination has been shown to have a stronger adverse effect on mental health outcomes (34, 35). The relatively high sensitivity of the EDS survey item to any amount of day-to-day stress would particularly affect the combined discrimination score, because even those citing one item as occurring less than once a year are classified as having experienced discrimination.

It is possible the younger age of participants may impact the differences observed, because MEOD focuses on events cumulatively throughout their lifetime while EDS centers more on recent events (35). Young adults having experienced multiple major discriminatory events are not equivalent to young adults reporting multiple day-to-day stressors. These differences in magnitude of everyday versus major events are also linked to the necessity of adaptation (35, 36). Longitudinal evidence has shown decreasing discrimination over time for young gay and bisexual men, providing evidence

for the development of resilience in the face of discrimination and the link between resilience and reduced internalized homophobia over time (37-39).

Some buffering from the deleterious effects of discrimination can be seen when social, cultural, and community resources and support are provided related to minority identity (35, 36). Although individual coping mechanisms can help ameliorate discriminatory effects, this is not available to every member of marginalized groups, highlighting the benefit of universally available community support systems. This is particularly important considering developmental differences for younger people who emphasize external factors compared with older adults who emphasize internal factors (40).

Group affiliation provides space where individuals are not stigmatized for minority status and support that may promote reappraisal of stigmatizing events (41). Specifically, for non-heterosexual identity, several positive coping mechanisms have been identified related to sexual-minority social support networks including connection, belonging, empathy, coming-out-related growth, and social activism (42, 43). Evidence has shown that there is a perceived lack of a BMSM community and that social exclusion from both white gay spaces and black heteronormative spaces provides difficulty for many BMSM (44), suggesting a greater need for specific community resources.

**Limitations**

This analysis has several limitations that should be considered. The cross-sectional nature of the analysis limited determination of temporality. However, the outcome data were obtained via laboratory analysis of biomarkers rather than through

self-report, which decreases misclassification and is a strength of this analysis. In order to observe significant effects on a smaller scale, greater power would have been necessary, and this secondary analysis was underpowered to observe interaction between socio-economic status (SES) and discrimination.

The possible interaction between SES and discrimination was suspected based on preliminary data analysis and previous literature which suggests that higher SES for black/African-Americans is associated with higher discrimination (45-48). Although higher income and education are typically associated with better health, lesser protective effects among minority race/ethnicity groups have been observed compared to benefits seen for white individuals. This suggests that socio-economic status functions differently as a social determinant of health by race (47, 49). Further investigation into this complex relationship between race/ethnicity and various social determinants of health is crucial to be able to accurately represent health disparity, because conventional means of considering these variables may not be appropriate across all groups.

These findings must be understood in the context of other stressors, because perceived discrimination does not wholly incorporate the effects of institutional and internalized discrimination, such as neighborhood segregation or self-destructive behavior (i.e., eating disorders, substance abuse, or HIV risk behaviors). Furthermore, discrimination is just one facet of chronic stress and is likely mediated or modified by other effects which further investigation may help to uncover. Nevertheless, the two

previously validated interpersonal discrimination scales included multiple items and also had high internal validity in our sample.

The recruitment methods of venue-based and online sampling utilized in this study may have led to some selection bias in terms of an overrepresentation of individuals with access to sexual-minority social support, because many participants were recruited from gay-friendly venues such as bars or events or referred by study participants who were currently enrolled. Because this social support lowers reactivity towards prejudice (39), the population enrolled may have greater access to the benefits of these communities compared with the overall YBMSM population, leading to lower discrimination scores and a modification of the relationship with HIV outcomes.

**Future Directions**

Additional study is needed to elucidate the relationship between the varying types of discrimination and how they affect HIV health as well as avenues through which this information could be leveraged to decrease the health disparity for YBMSM. Subjective measures of discrimination such as those utilized in this analysis require the perception and reporting of events in order to be considered (30). Ideally, discrimination would be tracked longitudinally and would include objective measures of discrimination including neighborhood level factors (50, 51) or utilizing meta-data (52). The development of tailored scales to assess discrimination and minority stress for those with intersectional identities would allow for greater resolution regarding the effects of

racism, homophobia, and HIV stigma individually and in combination, as this is a current shortcoming in quantitative research (44).

With the inclusion of factors such as resilience and stress related growth which mediate and mitigate the negative effects of discrimination and other stressors researchers can also identify more nuanced mechanisms for the effect on physical and mental health (38, 39, 53). Focusing on strength and the ability to thrive despite challenges should be central to any further research regarding discrimination, because it may lead to actionable interventions at individual or community levels.

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## Tables

**Table 1. Participant Characteristics at Baseline for an Analysis of Young, Black MSM in Atlanta, GA 2014-2016.**

| Variable | Participants HIV Positive at Baseline |
|---|---|
| **N** | 164 |
| **Age - Mean (SD)** | 25.9 (2.6) |
| **Education - N (%)** | |
| At Least Some College | 112 (68) |
| High School or Less | 52 (32) |
| **Income - N (%) *** | |
| <$20,000/year | 84 (56) |
| ≥$20,000/year | 66 (44) |
| **Sexual Orientation - N (%)** | |
| Gay/Homosexual | 137 (84) |
| Bisexual | 22 (13) |
| Other | 5 (3) |
| **Current HIV Medication - N (%) *** | |
| Yes | 92 (58) |
| No | 66 (42) |
| **HIV Status Awareness - N (%)** | |
| Aware | 136 (82) |
| Unaware | 29 (18) |
| **Viral Load - N (%) *** | |
| Undetectable | 71 (44) |
| Detectable | 89 (56) |
| **CD4+ T Cell Count *** | |
| ≥500 | 85 (53) |
| 200-499 | 58 (36) |
| <200 | 17 (11) |
| **Everyday Discrimination Score *** | |
| Minimum | 0 |
| Median (IQR) | 8 (16) |
| Maximum | 45 |
| **Major Experiences of Discrimination - N (%) *** | |
| Score: 0 | 61 (37) |
| Score: 1 | 40 (25) |
| Score: 2 | 31 (19) |
| Score: 3-6 | 31 (19) |

SD: Standard deviation

* Missing: Income (14), Current Medication (6), Viral Load (4), CD4 Count (4), Everyday Discrimination Score (1), Major Experiences of Discrimination Score (1)

**Table 2. Participant Characteristics at Baseline by HIV Status for an Analysis of Young, Black, Men who have Sex with Men in Atlanta, GA 2014-2016.**

| Variable | HIV Status | | |
|---|---|---|---|
| | Positive | Negative | P value |
| **N (%)** | 164 (35) | 300 (65) | |
| **Age - Mean (SD)** | 25.9 (2.6) | 24.3 (3.0) | <0.0001 |
| **Education - N (%) *** | | | 0.25 |
| At Least Some College | 113 (69) | 221 (74) | |
| High School or Less | 51 (31) | 78 (26) | |
| **Income - N (%) *** | | | <0.01 |
| <$20,000/year | 84 (56) | 115 (41) | |
| ≥$20,000/year | 66 (44) | 166 (59) | |
| **Everyday Discrimination Score *** | | | <0.01 |
| Minimum | 0 | 0 | |
| Median (IQR) | 8 (1-16) | 12 (4-21) | |
| Maximum | 45 | 45 | |
| **Major Experiences of Discrimination - N (%) *** | | | 0.70 |
| Score: 0 | 61 (37) | 127 (43) | |
| Score: 1 | 40 (25) | 67 (23) | |
| Score: 2 | 31 (19) | 55 (19) | |
| Score: 3-6 | 31 (19) | 46 (16) | |

SD: standard deviation

* Missing: Education (1), Income (33), Everyday Discrimination Score (5), Major Experiences of Discrimination Score (6)

**Table 3. Bivariate Relationship Between Undetectable Viral Load and Select Characteristics among 164 young, black, men who have sex with men, living with HIV, Altanta, 2014-2016.**

| Variable | Viral Load | | |
|---|---|---|---|
| | **Detectable** | **Undetectable** | **P Value** |
| **N (%) *** | 89 (56) | 71 (44) | |
| **Age - Mean (SD)** | 25.6 (2.6) | 26.2 (2.5) | 0.13 |
| **Education - N (%)** | | | 0.04 |
| At Least Some College | 54 (61) | 54 (76) | |
| High School or Less | 35 (39) | 17 (24) | |
| **Income - N (%) *** | | | 0.01 |
| <$20,000/year | 52 (64) | 29 (44) | |
| ≥$20,000/year | 29 (36) | 37 (56) | |
| **Current HIV Medication - N (%) *** | | | <0.0001 |
| Yes | 34 (40) | 57 (81) | |
| No | 50 (60) | 13 (19) | |
| **HIV Status Awareness - N (%)** | | | <0.0001 |
| Aware | 61 (69) | 71 (100) | |
| Unaware | 28 (31) | 0 (0) | |
| **Everyday Discrimination Score - Median *** | 8 | 8.5 | 0.74 |
| **Combined Discrimination Score *** | | | 0.66 |
| No discrimination | 13 (15) | 12 (17) | |
| Any discrimination | 76 (85) | 58 (83) | |
| **Quartiles of Everyday Discrimination Score - N (%) *** | | | 0.60 |
| First Quartile: 0 | 21 (24) | 17 (24) | |
| Second Quartile: 1-8 | 27 (30) | 18 (26) | |
| Third Quartile: 9-17 | 19 (21) | 21 (30) | |
| Fourth Quartile: 18-45 | 22 (25) | 14 (20) | |
| **4 Level Major Experiences of Discrimination Score - N (%) *** | | | 0.54 |
| Score: 0 | 30 (34) | 30 (43) | |
| Score: 1 | 22 (25) | 18 (26) | |
| Score: 2 | 18 (20) | 12 (17) | |
| Score: 3-6 | 19 (21) | 10 (14) | |

SD: standard deviation

* Missing: Viral Load (4), Income (13), Current Medication (6), Combined Discrimination (1), Everyday Discrimination Score (1), Major Experiences of Discrimination Score (1).

**Table 4. Bivariate Relationships Between CD4+ T Cell Count Progression and Select Characteristics among 164 young, black, men who have sex with men, living with HIV, Altanta, 2014-2016**

| Variable | CD4 Count | | | |
|---|---|---|---|---|
| | **<200** | **200-499** | **≥500** | **P Value** |
| **N (%) *** | 17 (11) | 58 (36) | 85 (53) | |
| **Age – Mean (SD)** | 25.9 (2.8) | 25.6 (2.6) | 25.9 (2.5) | 0.28 |
| **Education – N (%)** | | | | 0.67 |
| At Least Some College | 11 (65) | 38 (66) | 60 (71) | |
| High School or Less | 6 (35) | 20 (34) | 25 (29) | |
| **Income – N (%) *** | | | | 0.01 |
| <$20,000/year | 11 (73) | 35 (69) | 36 (45) | |
| ≥$20,000/year | 4 (27) | 16 (31) | 44 (55) | |
| **Current HIV Medication – N (%) *** | | | | 0.03 |
| Yes | 10 (63) | 24 (44) | 56 (67) | |
| No | 6 (38) | 30 (56) | 28 (33) | |
| **HIV Status Awareness – N (%)** | | | | 0.06 |
| Aware | 14 (82) | 43 (74) | 76 (89) | |
| Unaware | 3 (18) | 15 (26) | 9 (11) | |
| **Combined Discrimination Score *** | | | | 0.23 |
| No discrimination | 2 (11) | 12 (21) | 9 (11) | |
| Any discrimination | 16 (89) | 46 (79) | 75 (89) | |
| **Everyday Discrimination Score – Median*** | 5 | 8 | 9 | 0.67 |
| **Quartiles of Everyday Discrimination Score – N (%) *** | | | | 0.90 |
| First Quartile: 0 | 4 (24) | 16 (28) | 18 (21) | |
| Second Quartile: 1-8 | 6 (35) | 15 (26) | 23 (28) | |
| Third Quartile: 9-17 | 5 (29) | 15 (26) | 22 (26) | |
| Fourth Quartile: 18-45 | 2 (12) | 12 (21) | 21 (25) | |
| **4 Level Major Experiences of Discrimination Score – N (%) *** | | | | 0.70 |
| Score: 0 | 7 (41) | 23 (40) | 29 (35) | |
| Score: 1 | 5 (29) | 10 (17) | 24 (29) | |
| Score: 2 | 2 (12) | 11 (19) | 17 (20) | |
| Score: 3-6 | 3 (18) | 14 (24) | 14 (17) | |

* Missing: CD4 Cell Count (4), Income (14), Current Medication (6), Combined Discrimination (1), Everyday Discrimination Score (1), Major Experiences of Discrimination Score (1).

**Table 5. Regression Results for Odds of Detectable Viral Load and CD4+ T Cell Count Progression among 164 young black MSM living with HIV, Altanta, 2014-2016.**

| Variable | Detectable Viral Load | | | CD4 Cell Count Progression | | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | | OR | 95% CI | |
| **Combined Discrimination Score** | | | | | | |
| No discrimination | Reference | | | Reference | | |
| Any discrimination | 1.80 | 0.65 | 5.00 | 0.57 | 0.23 | 1.41 |
| **Quartiles of Everyday Discrimination Score** | | | | | | |
| First Quartile: 0 | Reference | | | Reference | | |
| Second Quartile: 1-8 | 1.38 | 0.50 | 3.86 | 0.71 | 0.28 | 1.76 |
| Third Quartile: 9-17 | 0.88 | 0.31 | 2.46 | 1.00 | 0.41 | 2.45 |
| Fourth Quartile: 18-45 | 1.61 | 0.52 | 5.00 | 0.42 | 0.14 | 1.23 |
| **4 Level Major Experiences of Discrimination Score** | | | | | | |
| Score: 0 | Reference | | | Reference | | |
| Score: 1 | 1.74 | 0.66 | 4.62 | 0.62 | 0.25 | 1.51 |
| Score: 2 | 2.15 | 0.74 | 6.23 | 0.76 | 0.30 | 1.94 |
| Score: 3-6 | 3.54 | 1.14 | 11.02 | 1.20 | 0.48 | 2.98 |

Note: All models controlled for income and current HIV medication.

## Figures

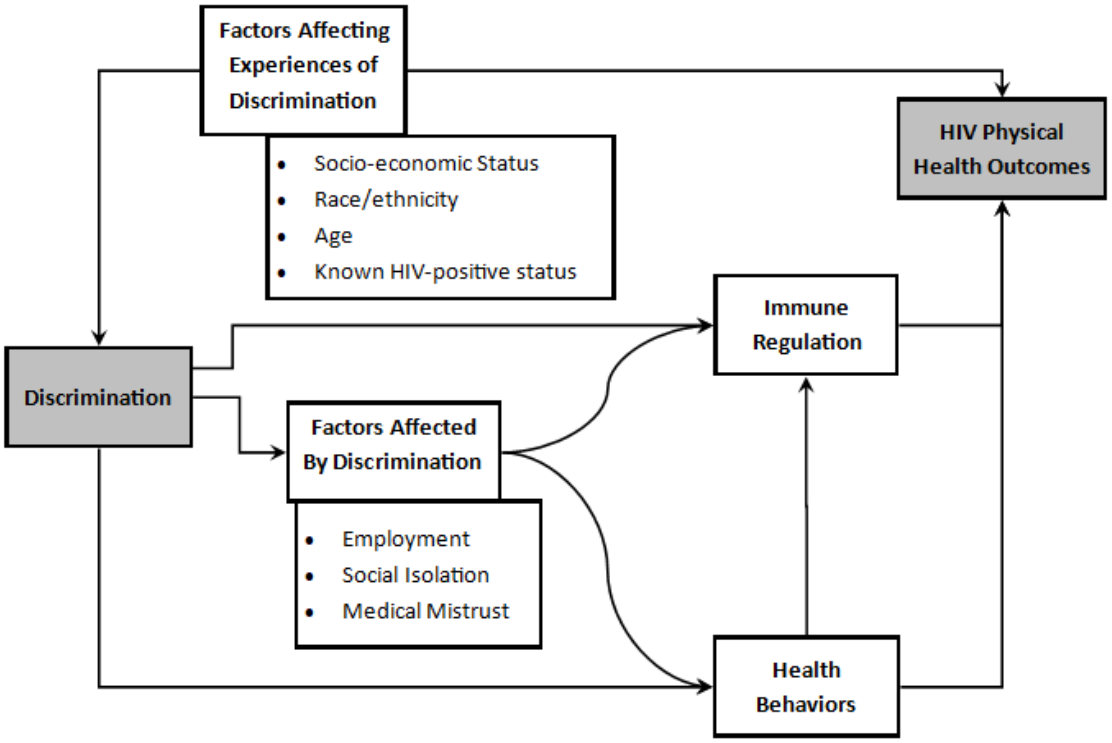


**Figure 1.** Directed acyclic graph demonstrating the proposed mechanism through which discrimination may affect HIV physical health and factors considered to mediate or potentially confound this relationship.

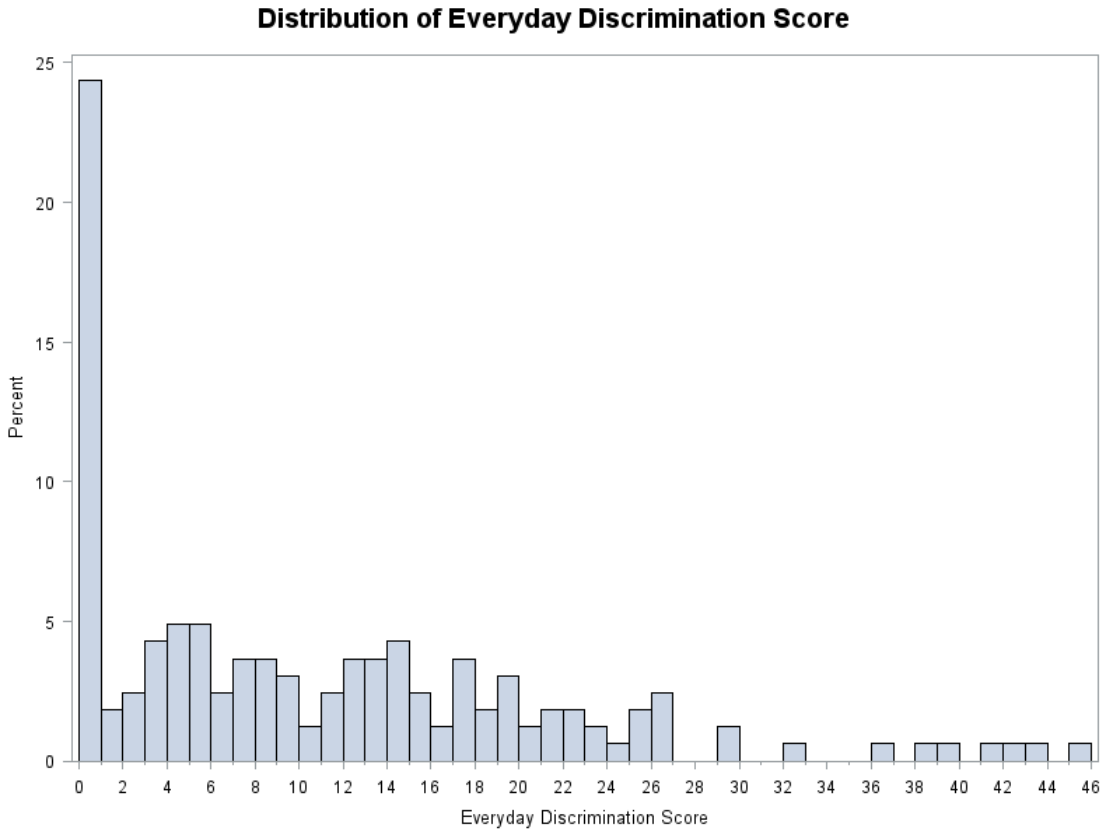


**Figure 2.** The distribution of Everyday Discrimination (25) Aggregate Scores by percentage of respondents reporting this score among the sample of 164 young, black, HIV-positive MSM in Atlanta, GA.

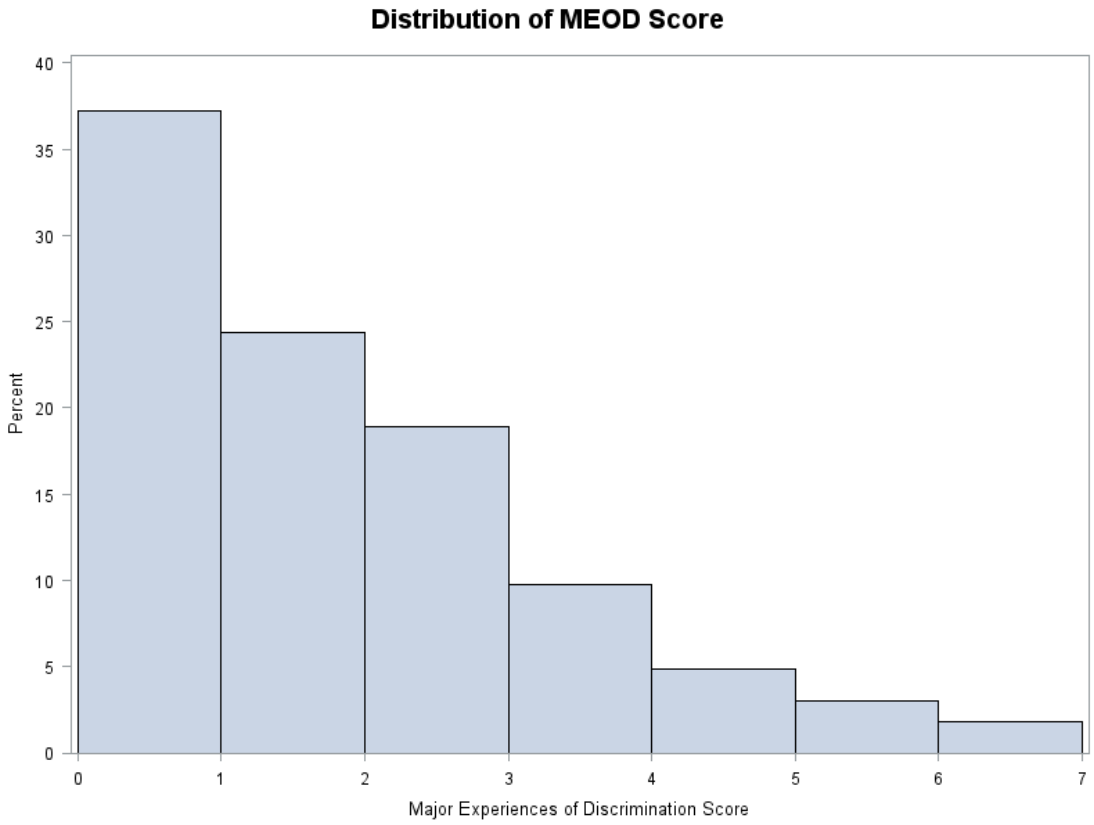


**Figure 3.** The distribution of Major Experiences of Discrimination (26) Aggregate Scores by percentage of respondents reporting this score among the sample of 164 young, black, HIV-positive MSM in Atlanta, GA.