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Prevalence of Hypertension in Young, Black Men Who Have Sex with Men: A Cross-Sectional Study

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Bachelor of Science in Public Health
Tulane University
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Abstract

Prevalence of Hypertension in Young, Black Men Who Have Sex with Men: A Cross-Sectional Study

By Carey Devine

Purpose: Young, Black men who have sex with men (YBMSM) have a higher risk of HIV and worse clinical outcomes of cardiovascular diseases compared to their heterosexual peers. Hypertension may exist at a young age, especially in sexual and racial minorities. We investigated the prevalence of hypertension in YBMSM and analyzed clinical and sociodemographic differences between hypertensive and non-hypertensive participants.

Methods: We performed a cross-sectional analysis of baseline data from a prospective cohort of 463 18–29-year-old YBMSM in Atlanta, GA collected during 2015-2017. Data were collected using an online questionnaire and clinicians measured blood pressure levels. Blood pressure status was categorized using the AHA's 2017 clinical guidelines. We calculated crude proportions of hypertension by demographic and clinical characteristics and calculated prevalence ratios using log binomial regression to compare hypertensive to non-hypertensive participants.

Results: Overall, 61.2% of YBMSM were hypertensive. Although 39.3% of participants did not have health insurance, 79.4% had visited a doctor in the past year. About one in six (16.2%) reported depression and 15.8% reported anxiety. More than half experienced at least one form of major discrimination, and one-third had ever been arrested. Hypertensive men were 47% more likely to be overweight or obese compared to non-hypertensive men (95% CI: 1.04–2.07).

Conclusions: YBMSM in Atlanta experience a high prevalence of hypertension. Coupling hypertension screenings with current HIV prevention initiatives could help YBMSM prevent and manage both conditions. Future longitudinal studies assessing long-term hypertension incidence in YBMSM and potential risk factors, particularly mental health and stressful life events, would be beneficial.

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Introduction

Sexual and gender minorities are at an increased risk of adverse health outcomes, including increased STI and HIV incidence and prevalence[1; 2]. As life expectancy in persons living with HIV continues to increase, the co-occurrence of chronic conditions is becoming an increasing concern[3]. Persons living with HIV experience fewer healthy years and develop comorbidities at an earlier age than uninfected individuals[4]. Compared to HIV-negative persons, adults with HIV show a higher prevalence of hypertension, putting them at an increased risk of developing cardiovascular disease and other chronic conditions[5; 6]. Despite a decrease in overall mortality, cardiovascular disease (CVD) mortality has increased in persons living with HIV [7]. Furthermore, persons living with HIV who died from CVD were more likely to be young, urban-dwelling, Black, and male compared to those who died from CVD in the general population[7]. The populations most at risk for HIV may also be at an increased risk of CVD. CVD risk factors, like hypertension, can be present at a young age before HIV is contracted, especially in sexual and racial minorities[8]. Young gay and bisexual men have been found to have a higher prevalence of hypertension than heterosexual peers, but few studies have investigated hypertension in Black sexual minorities, particularly in younger age groups.[9; 10]. Young, Black men who have sex with men (YBMSM) may be uniquely increased risk for both HIV infection and hypertension.

Black men, regardless of age, experience a high burden of both HIV and hypertension. From 2014 to 2018, African American MSM had the greatest number of new HIV infections in the United States and the prevalence of HIV is disproportionately higher in young, Black MSM compared to young, White MSM [2]. This disparity is greatest in the Southern United States, which accounted for the highest percentage of HIV diagnoses in the U.S. in 2018 and the highest number of new diagnoses in Black MSM[2]. Like HIV, the national prevalence of hypertension is

higher in Black men than in all other races[11; 12]. Hypertension and HIV also have similar geographic variations. A national cohort study examining regional and demographic differences in hypertension over 20 years found the highest incidence rates of hypertension in the Southeastern United States, and a recent analysis of self-reported hypertension from the 2017 Behavioral Risk Factor Surveillance System continues to find the highest prevalence of hypertension in the Southeast region[13; 14; 15]. Age-standardized hypertension prevalence also remained greatest among men and Black participants [13]. Consequently, Black MSM are a priority group for the prevention and treatment of both HIV and CVD.

Young men, especially young MSM, may be at an increased risk for cardiovascular disease starting at an early age. In 2013–2014, approximately 10% of young men aged 18–39 years were found to be hypertensive and 33.6% were found to be pre-hypertensive [16]. In 2017, the American Heart Association (AHA) updated their Hypertension Clinical Guidelines, and this change resulted in a greater number of young Americans being classified as hypertensive. Partially driven by the more sensitive updated AHA clinical guidelines, the national prevalence among men aged 18–39 years increased to 31.2% during 2017–2018 [12]. High blood pressure in young adulthood corresponds with an increased risk of CVD, coronary heart disease, and all-cause mortality[17]. This association is particularly important considering that young gay and bisexual men have a higher prevalence of hypertension and other CVD risk factors, including pulse rate, C-reactive protein, glycosylated hemoglobin, and waist circumference, compared to heterosexual men, even after controlling for other risk factors[9; 18; 19]. Additionally, sexual minority men who experienced stressful life events such as exposure to abuse, violence, or homelessness, or chronic stress and stigma showed elevated cardiometabolic risks compared to their heterosexual counterparts[8; 20;21]. The increased prevalence of hypertension and other

cardiometabolic risk factors in young MSM make them more susceptible to CVD. Socioeconomic risk factors for CVD, such as lack of healthcare access and structural racism, may also be risk factors for HIV, leading to a joint risk of these conditions.

HIV and chronic conditions are likely to be prevalent among young, Black MSM, but factors associated with hypertension in a cohort of young, Black MSM have not yet been examined. We aimed to investigate the prevalence of hypertension in young, Black MSM and to investigate differences in clinical and demographic characteristics between hypertensive and non-hypertensive participants. Our findings will provide new information on hypertension in young, Black MSM in the South and inform prevention services that would target both sexual health and chronic conditions at an early stage in life.

Methods

The EleMENt study was an observational cohort study of young, Black men who have sex with men (MSM) in Atlanta, GA[22]. The primary aim was to examine the longitudinal relationship between substance use and HIV and STI incidence in YBMSM. We performed a cross-sectional analysis of participants in this cohort using data collected from participants' baseline visits.

Participants were eligible if they were: between 18 and 29 years old, were Black and not of Hispanic ethnicity, were born male and identified as male, lived or worked in the Atlanta Metropolitan Statistical Area, and had at least one male sex partner in the previous three months. This study was approved by the Emory University Institutional Review Board.

Recruitment

Sexually-active Black MSM in Atlanta between 18 and 29 years old were recruited into the EleMENt study from June 2015 through July 2017[22]. Recruitment methods included venue-based time sampling, peer referral, advertisements on Facebook and the app Grindr, and advertisements on local transit systems (MARTA). Venue-based sampling took place at a variety of bars, clubs, restaurants, malls, and parks in Atlanta where young, Black MSM spend time, as reported in focus groups. At these venues, study staff systematically approached men, obtained consent, and administered recruitment questions. If eligible, men were offered to participate in the study and provided their contact information. Venue attendance and recruitment progress were monitored and lists of sampling venues were adapted throughout the study. Venue-based sampling was supplemented with targeted recruitment on Facebook and Grindr. Advertisements were targeted to adult men in Atlanta with profiles indicating common interests of young, Black MSM. Men who clicked on the targeted ads were taken to an online screening form with recruitment questions. Enrolled participants could also refer up to three peers to enroll in the study. If recruitment eligibility criteria were met, participants were contacted to schedule an initial study visit.

Data Collection

All visits took place at one of the following study sites in Atlanta: Emory University Rollins School of Public Health, AID Atlanta, Southside Medical Center, and SisterLove. Baseline data collection consisted of an online questionnaire with topics on demographics, substance use, sexual behavior, mental health, and usage or interest in pre-exposure prophylaxis (PrEP).

Biological specimen collection, including screening for HIV, STIs, and Hepatitis C was performed by study staff. Blood was collected by a phlebotomist. An HIV rapid test was done

and preliminary positives were confirmed with an antigen/antibody 4th generation test per CDC guidelines[23]. For HIV-positive participants, CD4 cell and plasma viral load levels assessed. Participants provided urine specimens to screen for non-prescription drugs and recent (within seven days) heavy alcohol use. Self-administered rectal and pharyngeal swabs to test for rectal and oral chlamydia and gonorrhea were also performed.

During the baseline visit, all participants were shown an informational video about PrEP and were offered to discuss PrEP use with a counselor. If they were interested in starting PrEP, a visit with a clinician was scheduled 1-2 weeks later. Participants were compensated for all study visits and complementary transportation to study sites was provided if needed.

Outcome Variables

Systolic and diastolic blood pressure levels were measured using an automated commercial device and reported as continuous variables. We used the current American Heart Association (AHA) clinical guidelines to categorize each participant's reading as their blood pressure status[24]. The AHA uses five blood pressure ranges: normal, elevated, hypertension stage 1, hypertension stage 2, and hypertensive crisis. Following these guidelines, our blood pressure status of normal was defined as having systolic blood pressure <120 mmHg and diastolic blood pressure <80 mmHg. An elevated blood pressure status was defined as systolic blood pressure from 120–129 mmHg and diastolic blood pressure <80 mmHg. We combined the AHA categories of hypertension stages 1, 2, and hypertensive crisis into one category called hypertensive, defined as systolic blood pressure >130 mmHg or diastolic blood pressure >80 mmHg.

Explanatory Variables

Demographic variables collected by the online questionnaire included age at baseline visit, education level, employment status, current homelessness, and homelessness within the past six months. Variables used as indicators of healthcare access and use included having health insurance coverage, attending a doctor visit in the last 12 months, having an STI test in the last 12 months, and whether participants ever had an HIV test. Any and current usage of PrEP and smoking status were also collected.

Clinical variables measured included systolic and diastolic blood pressure. Body mass index (BMI) was calculated from participants' weight and height measurements and was categorized into underweight, normal weight, overweight and obese[25]. Self-reported HIV status was asked in the questionnaire and status was confirmed by results from the HIV rapid test performed at the baseline visit. Participants also reported if they had ever been diagnosed by a doctor with diabetes, high cholesterol, high blood pressure, depression, or anxiety.

Factors considered stressful life events include ever having been arrested, not disclosing MSM status with any family members, and experiences of discrimination. We used the Everyday Discrimination Scale to measure the frequency of day-to-day discrimination (Figure 1), and we used the Major Discrimination Scale to measure if any major discrimination was ever experienced (Figure 2)[26; 27]. For each scale, each "yes" or "checked" response was allocated one point and was equally weighted. The responses were summed, and we obtained a mean score for each scale, with a higher mean score corresponding to more frequently experiencing everyday or major discrimination.

Data Analyses

We summarized demographic and clinical data descriptively for the entire cohort. Crude proportions of participants with each characteristic were calculated by category of blood pressure status, which included normal, elevated, and hypertensive. Differences in characteristics by blood pressure status were compared using Fisher's exact or χ^2 tests for categorical variables and ANOVA tests for continuous variables. All reported p-values are two-sided. Log binomial regression was used to estimate prevalence ratios for selected exposures between hypertensive and non-hypertensive participants. Crude and adjusted prevalence ratios and 95% confidence intervals were calculated using a marginal approach[28]. Factors considered potential confounders of the relationship between selected exposures and hypertension were BMI category and current smoking status, depression, anxiety, experiencing any major discrimination, and ever being arrested were also included in the adjusted model to investigate less commonly reported factors. Statistical analyses were performed using SAS version 9.4 software.

Results

We analyzed data from 463 participants that completed a baseline visit between June 2015 and July 2017. As shown in Table 1, 61.2% of participants were classified as hypertensive and 14.0% were classified as having elevated blood pressure. Overall, the mean age of participants was 24.9 years old. Mean BMI was 25.7 kg/m^2 ; 28.1% were classified as overweight and 16.9% were classified as obese. Nearly three-quarters of participants were employed full-time or part-time. At the time of the study, 39.4% of participants did not have health insurance, and 12.5% had been homeless at some point in the previous twelve months. Most men (79.3%) had visited a doctor in the previous twelve months, and 65.0% had an STI test within the same time period. Almost all (96.1%) had an HIV test at some point in their life. Few men (9.2%) had ever used PrEP in their lifetime. There were 16.2% of participants that reported ever having depression,

and 15.8% that reported ever having anxiety. More than a third of participants were HIV positive at the time of their study visit. A majority of participants (58.7%) reported experiencing at least one form of major discrimination in their lifetime, and over one third of participants had ever been arrested.

Among the 284 (61.2%) hypertensive participants, the mean age was 24.8 years old and the mean BMI was 27.0 kg/m^2. Most overweight or obese participants were hypertensive, and about half of those classified as normal weight were also hypertensive. There were 55.8% of HIV-positive participants that were hypertensive. Most men without health insurance were hypertensive (64.8%) or had elevated blood pressure (12.1%). Approximately 75% of men with anxiety and approximately 75% of those with depression had elevated blood pressure or hypertension. Most of the cohort had not been previously diagnosed as having high blood pressure outside of this study; however, our study found that 58.7% of those who did not know they had high blood pressure were actually hypertensive. Increasing BMI was associated with higher blood pressure.

Table 2 shows the crude estimates of the association between hypertension and predictors using log binomial regression. Hypertensive men were 13% less likely to be living with HIV compared to non-hypertensive men (95% CI: 0.74–1.02). Those with hypertension were 40% more likely to have been told by a doctor prior to this study that they had high blood pressure compared to those without hypertension (95% CI: 1.21–1.63). Participants with hypertension were 10% more likely to not have health insurance (95% CI: 0.95–1.27), but the prevalence of hypertension was similar among participants who visited a doctor in the previous year compared to participants who did not (PR = 0.99, 95% CI: 0.83–1.18).

Results from the adjusted model are presented in Table 3. Participants who were overweight or obese were 47% more likely to be hypertensive (95% CI: 1.04-2.07) after controlling for homelessness, BMI category, current smoking status, depression, anxiety, experiencing any major discrimination in lifetime, and ever being arrested. Those that had experienced homelessness in the past 6 months had 19% increased prevalence of hypertension (95% CI: 0.76–1.86), current smokers had 8% increased prevalence of hypertension (95% CI: 0.76–1.52), and participants who had ever been arrested experienced a 23% increased prevalence of hypertension (95% CI: 0.90–1.69). Men previously diagnosed with anxiety had 24% decreased prevalence of hypertension (95% CI: 0.48–1.21). There was no significant association between hypertension and anxiety, depression, or experiencing any lifetime discrimination.

Discussion

More than 60% of young, Black MSM in this study were hypertensive and an additional 14% had elevated blood pressure. The young, Black MSM in our cohort had a greater hypertension prevalence than the national prevalence in both young men (61% vs. 31%) and in all-ages Black men (61% vs. 57%)[12]. Another nationally representative sample taken from middle and high school students of all races estimated the prevalence of hypertension in gay men to be 39% regardless of race, which is also lower than our findings[9]. Though we only studied one cohort of Black MSM, this might suggest that young men who are both Black and have sex with men experience a higher prevalence of hypertension, compared to their Black non-MSM or their white MSM counterparts.[29; 30]. A 2003 Canadian health survey assessing cardiovascular health inequities concluded that race, gender, class, and sexuality must be assessed in an intersectional way to predict hypertension[31]. This could suggest that being both Black and a sexual minority may interact in a synergistic way to put young, Black MSM more at risk for CVD compared to

non-Black MSM or heterosexual Black men alone. However, our sample size was limited and further investigation is warranted.

More than one third of our cohort was also HIV-positive. High prevalence of hypertension, HIV, and the coexistence of the two could make it more challenging for young, Black MSM to manage both chronic conditions, especially as they age. A Chicago cohort also found high levels of biomarkers in young MSM that are associated with CVD risk, specifically C-reactive protein, interleukin-1 beta, interleukin-6, and interleukin-15[8]. The high prevalence of hypertension among YBMSM in our study is consistent with this result and supports the finding that MSM are at an increased risk for CVD beginning at an early age.

Mental health conditions were fairly common among the cohort. There was a higher prevalence of depression and anxiety than other chronic disorders, including diabetes and high cholesterol, suggesting that mental health conditions may be a greater concern among young, Black MSM. We found no significant association between hypertension and depression or anxiety; however, these conditions were self-reported and may have been underestimated due to never accessing or being diagnosed by a physician. Consequently, participants may have reported that they do not have these conditions when they do (social desirability bias)[32].

More than half of our participants indicated they had experienced at least one type of major discrimination and more than a third of participants had been arrested in their lifetime. A nationally representative cohort study found that exposure to both high and low levels of stressful life events predicted increased cardiovascular disease (CVD) risk factors in young gay and bisexual men[20]. Taken together with our findings, this indicates that stressful life events and mental health may be important factors in understanding cardiovascular risks and are worth continued investigation.

BMI is known to be positively associated and share common risk factors with systolic and diastolic blood pressure[33; 34]. We found that a higher BMI was associated with an increased prevalence of hypertension. Compared to another population-based study of young sexual and gender minority men, the mean BMI of our cohort (25.7 kg/m^2) was similar to their finding of 25.5 kg/m^2 [8]. In addition to being a marker for high blood pressure, another cohort study of young adults suggested higher BMI was causally related to higher blood pressure[35]. As BMI increases, this could make blood pressure even more challenging to manage.

PrEP use was limited amongst our cohort. Healthcare inaccessibility, including insurance and difficulty navigating the healthcare system, is commonly cited by MSM in qualitative interviews as a barrier to PrEP use and adherence[36; 37]. Despite a high proportion of our participants being uninsured, most of them still had a medical visit or an STI test within the past year and almost all had received and HIV test at some point in their life, indicating that access to STI/HIV healthcare may not be restricted by insurance coverage. However, more information is still needed on other barriers, such as stigma and distrust of healthcare providers.

This study has limitations. Assessing hypertension occurrence was not the primary aim of the EleMENt study and the study was not designed to capture all potentially relevant information or potential associations with hypertension. Our exploratory, cross-sectional analysis is limited to assessing associations at the baseline study visit only and may not be reflective of changes in the population over time. Misclassification of self-reported data could underestimate prevalence of other chronic conditions and result in response bias[32], because men that attended regular healthcare visits may have had greater opportunity to be defined by a doctor as diabetic, depressed, anxious, or having high cholesterol and blood pressure. Our study was limited to young, Black MSM in Atlanta and findings may not be nationally representative or generalizable

to young, Black MSM in rural communities or other cities because of potential differences in perceived stigmas, social support, and access to healthcare. Statistical power for some tested associations was limited due to our small sample size.

In conclusion, we found that young, Black MSM in Atlanta experienced a high prevalence of both hypertension and HIV concurrently. While it is concerning that most men in this young cohort were hypertensive, most were also outside the hypertensive crisis range which still leaves an opportunity for intervention and blood pressure management. Targeting blood pressure screening and care to MSM already seeking STI and HIV care may be a useful prevention tool to help young, Black MSM prevent and manage both conditions. The EleMENt study is an example of a public health research program that has implemented hypertension prevention into its HIV research and prevention work by offering screenings and referrals to primary care providers. Future longitudinal studies that assess long-term hypertension incidence in young, Black MSM and potential risk factors, particularly mental health conditions and stressful life events, would be beneficial.

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Table 1. Demographic and clinical characteristics of young Black men who have sex with men, Atlanta 2015-2017 (N=463)

			Blood Pressure Status						
Characteristic	**Total**		**Normal**		**Elevated**		**Hypertensive**		**p-value[3]**
	n/Mean	**Col %/SD**	**n/Mean**	**Row %/SD**	**n/Mean**	**Row %/SD**	**n/Mean**	**Row %/SD**	
Total	463	100.0	114	24.6	65	14.0	284	61.2	
Age	24.9	3.0	25.1	2.9	25.0	2.6	24.8	3.1	0.50
18 to 21	74	16.0	16	21.6	5	6.8	53	71.6	
22 to 25	176	37.9	40	22.9	33	18.9	102	58.3	
26 to 29	214	46.1	58	27.1	27	12.6	129	60.3	
Education									0.39
<High School	12	2.6	5	41.7	1	8.3	6	50.0	
High School or equivalent	117	25.1	21	18.1	16	13.8	79	68.1	
>High School	334	72.3	88	26.3	48	14.4	198	59.3	
Employment[1]									0.08
Employed (full-time)	262	56.6	58	22.1	38	14.5	166	63.4	
Employed (part-time)	78	16.8	29	37.7	5	6.5	43	55.8	
Student	55	11.9	13	23.6	9	16.4	33	60.0	
Unemployed	55	11.9	13	23.6	11	20.0	31	56.4	
Other	14	3.02	1	7.1	2	14.3	11	78.6	
Health insurance									0.75
No	182	39.4	42	23.1	22	12.1	118	64.8	
Yes	261	56.5	67	25.7	40	15.3	154	59.0	
Unknown	19	4.1	5	26.3	3	15.8	11	27.9	
Visited doctor in last 12 months									0.90
No	95	20.7	24	25.3	12	12.6	59	62.1	
Yes	365	79.3	88	24.1	53	14.5	224	61.4	
STI test in last 12 months									0.40
No	145	31.5	37	25.2	14	9.7	94	64.8	
Yes	299	65.0	73	24.4	49	16.4	177	59.2	
Unknown	16	3.5	3	18.8	2	12.5	11	68.8	
Ever had HIV test									0.28
No	16	3.46	4	25.0	1	6.3	11	68.7	
Yes	445	96.1	109	24.5	63	14.2	273	61.4	
Unknown	2	0.4	1	50.0	1	50.0	0	0.0	
Homeless in past 6 months									0.16
No	398	87.5	96	24.1	51	12.8	251	63.1	
Yes	57	12.5	17	29.8	11	19.3	29	50.9	
Currently homeless									0.36
No	31	54.4	9	29.0	4	12.9	18	58.1	
Yes	26	45.6	8	30.8	7	26.9	11	42.3	
PrEP use (ever)									
No	304	90.5	66	21.7	42	13.8	196	64.5	0.53
Yes	31	9.2	9	29.0	6	19.4	16	51.6	

Unknown	1	0.3	0	0.0	0	0.0	1	100.0	
Current PrEP user									0.42
No	11	35.5	4	36.4	3	27.3	4	36.4	
Yes	20	64.5	5	25.0	3	15.0	12	60.0	
Smoked >5 packs in lifetime									0.50
No	321	69.6	73	22.7	43	13.4	205	63.9	
Yes	131	28.4	37	28.2	21	16.0	73	55.7	
Unknown	9	2.0	3	33.3	1	11.1	5	55.6	
Smoke now (cigarettes)[2]									0.77
No	22	17.5	5	22.7	3	13.6	14	63.6	
Yes	104	82.5	30	28.9	18	17.3	56	53.9	
Systolic blood pressure (mm Hg) [range: 82-189]	127.0	13.9	112.2	6.2	123.7	2.8	133.7	12.8	< 0.001
Diastolic blood pressure (mm Hg) [range: 42-129]	79.6	10.1	71.0	5.4	71.6	7.0	84.9	8.4	< 0.001
BMI [range: 15.7-65.8]	25.7	6.0	23.3	3.2	24.3	3.5	27.0	6.8	< 0.001
Underweight	11	2.4	4	36.4	0	0.0	7	63.6	
Normal weight	244	52.8	76	31.2	43	17.6	125	51.2	
Overweight	139	28.1	32	24.6	19	14.6	79	60.8	
Obese	77	16.7	2	2.6	3	3.9	72	93.5	
Previously diagnosed with diabetes									0.63
No	456	98.5	113	24.8	65	14.3	278	70.0	
Yes	7	1.5	1	14.3	0	0.0	6	85.7	
Previously diagnosed with high cholesterol									0.82
No	447	96.5	110	24.6	64	14.3	273	61.1	
Yes	16	3.5	4	25.0	1	6.3	11	68.8	
Previously diagnosed with high blood pressure									< 0.01
No	412	89.0	109	26.5	61	14.8	242	58.7	
Yes	51	11.0	5	9.8	4	7.8	42	82.4	
Previously diagnosed with depression									0.60
No	388	83.8	95	24.5	52	13.4	241	62.1	
Yes	75	16.2	19	25.3	13	17.3	43	57.3	
Previously diagnosed with anxiety									0.17
No	390	84.2	95	24.4	50	12.8	245	62.8	
Yes	73	15.8	19	26.0	15	20.6	39	53.4	
HIV positive									0.16
No	298	64.4	66	22.2	40	13.4	192	64.4	
Yes	165	35.6	48	29.1	25	15.2	92	55.8	
Everyday discrimination score [range: 0-45]	12.1	10.7	14.0	12.1	10.0	10.0	11.9	10.1	0.04
Lifetime major discrimination score [range: 0-6]	1.2	1.4	1.3	1.6	1.2	1.3	1.2	1.4	0.65
Experienced any major discrimination (lifetime)									0.82
No	189	41.3	45	23.8	29	15.3	115	60.9	

Yes	269	58.7	68	25.3	36	13.4	165	61.3	
Ever been arrested									0.07
No	289	63.1	78	27.0	34	11.8	177	61.3	
Yes	169	36.9	34	20.1	31	18.3	104	61.5	
Disclosed MSM status with any family members									0.53
No	62	13.8	15	24.2	6	9.7	41	66.1	
Yes	387	86.2	94	24.3	58	15.0	235	60.7	

[1] Employed category also include participants in active-duty military. Unemployed category also includes those who are unable to work due to health reasons. Other responses include 12 self-employed participants and 1 participant on leave of absence.
[2] Only asked to participants who had ever smoked cigarettes or answered "Don't know".
[3] Chi Square test of independence or Fisher's exact tests were performed for categorical variables and ANOVA tests were performed for continuous variables.

Table 2. Unadjusted log binomial regression for the association between hypertension and its predictors among young Black men who have sex with men in Atlanta, 2015-2017

	Unadjusted Estimate	
Characteristic	**PR**	**95% CI**
Age	0.98	0.96 – 1.01
Unemployed		
No	Ref.	- - -
Yes	0.91	0.71 – 1.16
Health insurance (currently)		
No	1.10	0.95 – 1.27
Yes	Ref.	- - -
Visited doctor in last 12 months		
No	Ref.	- - -
Yes	0.99	0.83 – 1.18
STI test in last 12 months		
No	Ref.	- - -
Yes	1.01	0.96 – 1.05
Ever had HIV test		
No	Ref.	- - -
Yes	0.83	0.66 – 1.05
Homeless in last 6 months		
No	Ref.	- - -
Yes	0.81	0.62 – 1.05
PrEP use (ever)		
No	Ref.	- - -
Yes	0.98	0.76 – 1.27
Current smoker (cigarettes)		
No	Ref.	- - -
Yes	0.95	0.78 – 1.16
BMI category		
Underweight or normal	Ref.	- - -
Overweight or obese	1.41	1.22 – 1.63
Previously diagnosed with diabetes		
No	Ref.	- - -
Yes	1.41	1.03 – 1.92
Previously diagnosed with high cholesterol		
No	Ref.	- - -
Yes	1.13	0.80 – 1.58
Previously diagnosed with high blood pressure		
No	Ref.	- - -
Yes	1.40	1.21 – 1.63
Previously diagnosed with depression		
No	Ref.	- - -
Yes	0.92	0.75 – 1.14

Previously diagnosed with anxiety		
No	Ref.	- - -
Yes	0.85	0.68 – 1.07
HIV positive		
No	Ref.	- - -
Yes	0.87	0.74 – 1.02
Everyday discrimination score	1.00	0.99 – 1.00
Lifetime major discrimination score	0.99	0.94 – 1.04
Experienced any major discrimination (lifetime)		
No	Ref.	- - -
Yes	1.01	0.87 – 1.17
Ever been arrested		
No	Ref.	- - -
Yes	1.00	0.86 – 1.17
Disclosed MSM status to any family members		
No	1.09	0.90 – 1.32
Yes	Ref.	- - -

Table 3. Log binomial regression for the association between hypertension and its predictors, adjusted for homelessness, BMI category, current smoking status, depression, anxiety, experiencing any major discrimination in lifetime, and ever being arrested.

	Adjusted Estimate	
Characteristic	**PR**	**95% CI**
Homeless in last 6 months		
No	Ref.	- - -
Yes	1.19	0.76 – 1.86
Current smoker (cigarettes)		
No	Ref.	- - -
Yes	1.08	0.76 – 1.52
BMI category		
Underweight or normal	Ref.	- - -
Overweight or obese	1.47	1.04 – 2.07
Previously diagnosed with depression		
No	Ref.	- - -
Yes	0.97	0.62 – 1.52
Previously diagnosed with anxiety		
No	Ref.	- - -
Yes	0.76	0.48 – 1.21
Experienced any major discrimination (lifetime)		
No	Ref.	- - -
Yes	1.05	0.77 – 1.44
Ever been arrested		
No	Ref.	- - -
Yes	1.23	0.90 – 1.69

Figure 1. Questions used in the Everyday Discrimination Scale

Question (In day-to-day life, how often do the following happen?)
Treated with less courtesy than other people are
Treated with less respect than other people are
Receive poorer service than other people at restaurants or stores
People act as if they think you are not smart
People act as if they are afraid of you
People act as if they think you are dishonest
People act as if they are better than you
Called names or insulted
Threatened or harassed

Figure 2. Questions used in the Major Experiences of Discrimination Scale

Question (Have any of the following ever happened?)
At any time in your life, have you ever been unfairly fired from a job or been unfairly denied a promotion?
For unfair reasons, have you ever not been hired for a job?
Have you ever been unfairly stopped, searched, questioned, physically threatened or abused by the police?
Have you ever been unfairly discouraged by a teacher or advisor from continuing your education?
Have you ever been unfairly prevented from moving into a neighborhood because the landlord or a realtor refused to sell or rent you a house or apartment?
Have you ever been unfairly denied a bank loan?