

BMJ Open Characterisation of social support following incarceration among black sexual minority men and transgender women in the HPTN 061 cohort study

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ABSTRACT

Objective To examine longitudinal associations between recent incarceration and subsequent social support among black sexual minority men and transgender women, and whether associations differed between those who did and did not have support prior to incarceration.

Design A secondary analysis in 2020 of data from the HIV Prevention Trials Network 061, a cohort study of black sexual minority men and transgender women recruited in 2009–2010 and followed for 12 months.

Setting Six US cities (Atlanta, Boston, Los Angeles, New York City, San Francisco and Washington DC).

Participants Individuals ≥18 years of age who identified as black, reported being male or assigned male at birth, reported ≥1 unprotected anal intercourse event with a male partner in the past 6 months, and reported on incarceration at the 6-month follow-up visit.

Exposure Having spent ≥1 night in jail/prison in the past 6 months reported at the 6-month follow-up visit.

Outcome Social support measured using a six-item scale assessing frequency of emotional/informational, affectionate and tangible support (range 6–30); and dichotomous indicators of low support for each item (ie, receiving that form of support none/little of the time).

Results Among participants who returned for the 6-month visit (N=1169), 14% had experienced incarceration in the past 6 months. Mean support score was 20.9; 18.9 among those with recent incarceration versus 21.2 among those without. Recent incarceration predicted lower support (adjusted β -2.40, 95% CI -3.94 to -0.85). Those recently incarcerated had increased risk of lacking emotional/informational (eg, no one to talk to adjusted risk ratio (aRR) 1.55, 95% CI 1.13 to 2.13) and affectionate (aRR 1.51, 95% CI 1.11 to 2.04) but not tangible support. Effects appeared somewhat stronger among those who had support at baseline.

Conclusions Incarceration may reduce support on re-entry among black sexual minority men and transgender women, populations unequally targeted for incarceration and at risk for low support.

INTRODUCTION

Social support is the functional content of one's interpersonal relationships and social

Strengths and limitations of this study

- The longitudinal study of over 1000 black sexual minority men and transgender women in six US cities provides a large sample size for analyses.
- The use of inverse probability of treatment weighting reduces potential bias in the estimates of associations between recent incarceration and subsequent social support.
- The study is limited by a lack of data on the frequency and sources of the support.
- Measures are self-reported and may be subject to recall and social desirability bias.

resources one can call on during stressful events,¹ and is important for physical, emotional and mental health.² Support can buffer against adverse effects of stress on health by preventing one from appraising a situation as stressful and/or inhibiting maladaptive responses.³ Emotional support (eg, listening, understanding), informational support (eg, giving advice), affectionate support (eg, love, empathy) and tangible support (eg, receipt of aid and services)⁴ are linked to reduced morbidity and mortality from health outcomes such as diabetes, cardiovascular disease and depression.⁵ Individuals returning from incarceration may be especially in need of social support during re-entry, and support from a variety of sources such as partners, family, and friends are key for successfully reintegrating in to the community and reducing risk of substance use, poor mental health and sexually transmitted infection (STI)/HIV.^{6–9}

Yet, while social support following incarceration is vital, incarceration itself may disrupt and negatively affect the community and family ties to which an individual returns.^{8 10–12} Incarceration is associated

with declines in emotional support, particularly support from non-family members. In studies conducted in predominantly heterosexual samples, incarceration is linked to loss of intimate partnerships and diminished relationship quality,^{10–13} and couples are more likely to report lower levels of happiness and no longer cohabiting after re-entry.¹³ Incarceration-related disruption of social ties may affect other forms of support beyond emotional and affectionate. After returning from incarceration, having social connections is critical for securing employment¹⁴ and accessing other forms of tangible socioeconomic support. For example, among a sample of Midwestern males being paroled, quality ties to family were associated with employment attainment on re-entry, even after controlling for preincarceration employment.¹⁴

A group that may be particularly vulnerable to the detrimental impact of incarceration on social support but has not yet been a focus of research in this area are black sexual minority men (BSMM) and transgender women (BTW). Black people, including BSMM and BTW, are disproportionately affected by incarceration in the USA,¹⁵ primarily due to criminal justice policy and sentencing that exhibit substantial racial biases.¹⁶ Experiencing incarceration often carries a long-lasting stigma,¹⁷ and those who have experienced it often perceive high levels of stigma that may be internalised, potentially leading to self-stigmatisation and avoidance of family and friends to protect them from further stigma.^{18 19} In addition to potential incarceration-related marginalisation, BSMM and BTW may experience stigma and isolation due to intersections between their race and sexual identities. This is based on intersectionality theory,²⁰ which posits that individuals experience unique stigmas and discrimination based on the combinations of their identities, not simply their individual ones. BSMM and BTW experience both racism, homophobia and a unique intersection of the two that is not experienced by black heterosexual men or sexual/gender minorities of other racial groups.²¹ This stigma may include families of BSMM and BTW having negative attitudes towards same-sex relationships,²² and people of colour being excluded from the majority of lesbian, gay, bisexual, transgender, queer/questioning (LGBTQ) communities and social networks, with black LGBTQ people forming their own networks.²³ Hence, the negative effects of incarceration on social support could be exacerbated among BSMM and BTW who may already be at risk of reduced support.

Our study addresses this gap by examining the relationship between recent (ie, past 6 months) incarceration and postincarceration emotional/informational, affectionate and tangible forms of social support using HIV Prevention Trials Network (HPTN) 061, a study conducted among BSMM and BTW. We tested associations between incarceration and overall support and individual indicators of each form of support, assessing whether associations differed between those who did and did not have support prior to the incarceration.

METHODS

Patient and public involvement

This study is a secondary data analysis of HPTN 061 and no participants were directly involved.

Study sample and design

HPTN 061's procedures have been described in detail elsewhere.²⁴ The parent study aimed to assess the feasibility and acceptability of HIV prevention strategies among BSMM/BTW and enrolled 1553 participants from 2009 to 2010 in six US cities: Atlanta, New York City, Washington DC, Los Angeles, San Francisco and Boston. Eligible participants were individuals at least 18 years of age who self-identified as a man or reported being assigned male at birth, self-identified as Black, African American, Caribbean Black, or multiethnic Black, and reported at least one condomless anal intercourse event with a male partner in the past 6 months.²⁴ Participants completed a baseline survey using audio computer-assisted self-interviewing technology assessing topics including incarceration, sexual behaviours, substance use and social support; surveys were conducted again at 6 and 12 months. At baseline, demographic data were collected.

Measures

Incarceration. At the 6-month visit, participants reported the number of times that they had spent one or more nights in jail/prison in the past 6 months; those who reported they had spent at least one night incarcerated were defined as having experienced recent incarceration.

Social Support. Social support was measured at baseline and 12 months follow-up visit using items adapted from the RAND Medical Outcomes Study (MOS).²⁵ The original MOS social support scale contained 19 support items categorised in subscales of tangible support, affectionate support, emotional/informational support, positive social interactions. The original MOS subscales all had alphas >0.90 and could be combined to create an indicator of overall support, which had an alpha of 0.97.²⁶ From the original MOS support scale, one item from the tangible support subscale, four items from the emotional/informational support subscale, and one item from the affectionate support subscale were included in the HPTN 061 study; we analysed each of these items individually and did not include subscales in the analysis. While this abbreviated version of the scale has not been validated, it has been used previously in other HPTN 061 studies and is correlated with STI/HIV risk and mental health factors.^{24 27 28}

For each form of support described below, participants rated on a five-point scale the frequency they had received it in the past 6 months, ranging from none of the time to all of the time, which are the same response options as the original MOS social support scale items.

Emotional and informational support was assessed with four items capturing the frequency someone was available to listen, available to give good advice, be counted on to provide emotional support, and they had contact

with someone they feel close to in whom they can trust and confide in.

Affectionate support was assessed with one item measuring how often someone was available who shows love and affection.

Tangible support was assessed with one item that captured how often someone was available to help with daily chores.

Overall social support score at the 12-month follow-up was calculated as a continuous score (range 6–30) by summing the five-point response scale for six all social support items (Cronbach's alpha 0.95).

We also created dichotomous indicators of support for each item, in which it was dichotomised to 'having support' if they received that form of support for some, most or all of the time, and 'lacking support' for receiving that form of support none or little of the time.

Covariates. Covariates were assessed at baseline and included in the inverse probability of treatment weights (IPTW) described below. We selected covariates that we hypothesised were associated with both incarceration and social support based on the literature and directed acyclic graphs. Demographic covariates included study site at time of enrolment; age²⁹; gender identity defined as cisgender male and transgender female; unstable housing³⁰ defined as reporting lacking a stable home; high school education or less³¹; and insufficient income³¹ defined as reporting having insufficient income never or once in a while versus fairly often or very often.

Psychosocial covariates included self-reported hard drug use³² (ie, heroin, crack/cocaine, methamphetamine, prescription misuse or other drugs) in the past 6 months; weekly marijuana use; currently has health coverage; lifetime incarceration; Alcohol Use Disorders Identification Test score^{33 34}; depressive symptoms based on Centres for Epidemiologic Studies-Depression scale³⁵; physical and/or threatened violence due to race and/or sexuality, which is defined as reporting being threatened with and/or experiencing physical violence (ie, punched, kicked, beaten) that the participant attributed was due to their race and their sexuality³⁶; perceived racism and homophobia, which was measured using items from the Racism and Life Experience Scales-Daily Life Experiences scale, with 20 items each regarding experiences related to race and sexuality such as being ignored or not given the same service^{37 38}; and internalised homophobia, which was assessed by summing responses to a 7-item scale regarding how strongly participants agreed with statements such as 'I wish I weren't attracted to men,' and 'As a Black man, I try to act more masculine to hide my sexuality.'^{39 40} STI/HIV risk covariates including reporting sex with female partners in the past 6 months⁴¹; having received HIV testing³²; transactional sex in the past 6 months; multiple partnerships defined as higher than the median (≥ 3)⁴²; concurrent partnership defined as partners in addition to their primary partner in the past 6 months and currently cohabiting with primary partner.

Biologically ascertained covariates included HIV status at baseline and any STI (ie, syphilis assessed via blood testing, and gonorrhoea and chlamydia assessed via urine/rectal swab testing).

Analyses

We used R V.3.6.2 for analysis. Our analytical sample included participants who returned for the 6-month follow-up with non-missing data on recent incarceration history (N=1169). Scales with missing values were replaced with the mean value of the remaining items if fewer than 20% of items were missing. When $\geq 20\%$ of scale items were missing, the sum score was coded as missing. Of those in the analytic sample, approximately 34% were missing data on at least one covariate, and multiple imputation was used by imputing data 40 times using predictive mean matching in the 'mice' package.

The propensity of recent incarceration was calculated using logistic regression with the Ridge penalty conditional on the baseline covariates described above and used to estimate IPTW, which were stabilised using the probability of the recent incarceration measured at the 6-month study visit (see online supplemental table for associations between the covariates and recent incarceration).⁴³ This was conducted for each of the 40 imputed datasets. We used IPTW to adjust for potential confounding due to the large number of covariates and desire to account for potential selection into recent incarceration.

In the analyses, we first examined baseline factors associated with lacking all six forms of social support at 12 months (ie, low overall social support) by calculating the frequency and prevalence of each covariate by low overall social support, using modified Poisson regression with robust SEs to address convergence issues. We then estimated associations between recent incarceration reported at the 6-month study visit and continuous social support score measured at 12 months; we also estimated associations with lacking each individual form of social support at 12 months as well as lacking all six forms of social support at 12 months. We used unweighted and weighted modified Poisson regression with robust SEs to estimate risk ratios (RR) in each of the imputed datasets. To do so, parameter estimates and variances were extracted from each model, and pooled following Rubin's rules.⁴⁴ Unweighted and weighted RRs and SEs via the Delta Method for each form of social support were obtained using the 'margins' package.

To assess whether the association between recent incarceration at 6 months and social support reported at 12 months varied by status of baseline social support, we tested the significance of an incarceration by social support interaction term. Specifically, for each form of social support reported at 12 months, we included an interaction term between recent incarceration at 6 months and lacking that form of support at baseline. Because some differences in the relationship between recent incarceration at 6 months and social support at 12 months were observed depending on baseline support,

Table 1 Characteristics of HPTN 061 sample and associations with low social support at 12 months follow-up (N=1169)

Characteristic	Total (N=1169)	N (%)*, † with low social support (n=138)	RR (95% CI)
Age			
Median (min, max)	39.0 (18.0, 68.0)	41.0 (18.0, 58.0)	1.00 (0.99 to 1.01)
Gender			
Cisgender male	1118 (95.6)	127 (11.4)	Referent
Transgender female	49 (4.2)	11 (22.4)	1.94 (0.99 to 3.42)
Unstable housing			
No	1055 (90.2)	118 (11.2)	Referent
Yes	113 (9.7)	20 (17.7)	1.63 (0.99 to 2.56)
Less than high school education			
No	568 (48.6)	56 (9.9)	Referent
Yes	601 (51.4)	82 (13.6)	1.50 (1.07 to 2.12)
Insufficient income			
No	513 (43.9)	43 (8.4)	Referent
Yes	655 (56.0)	95 (14.5)	1.84 (1.29 to 2.66)
Ever incarcerated			
No	465 (39.8)	51 (11.0)	Referent
Yes	686 (58.7)	85 (12.4)	1.15 (0.82 to 1.64)
Depression scale (Centers for Epidemiologic Studies - Depression)			
Mean (SD)	16.4 (11.0)	21.2 (11.9)	1.03 (1.02 to 1.05)
Depression			
Score <16	624 (53.4)	53 (8.5)	Referent
Score ≥16	487 (41.7)	78 (16.0)	1.95 (1.38 to 2.78)
Racism scale			
Mean (SD)	49.5 (24.0)	49.3 (24.7)	1.00 (0.99 to 1.01)
Racism			
Score <median (52)	584 (50.0)	70 (12.0)	Referent
Score ≥median (52)	566 (48.4)	66 (11.7)	0.94 (0.67 to 1.31)
Experienced homophobia			
Mean (SD)	53.2 (31.5)	54.7 (32.8)	1.00 (1.00 to 1.01)
Experienced homophobia			
Score <median (54)	574 (49.1)	65 (11.3)	Referent
Score ≥median (54)	571 (48.8)	69 (12.1)	1.03 (0.74 to 1.45)
Internalised homophobia			
Mean (SD)	15.6 (7.01)	16.1 (7.93)	1.01 (0.99 to 1.03)
Internalised homophobia			
Score <median (15)	599 (51.2)	70 (11.7)	Referent
Score ≥median (15)	531 (45.4)	61 (11.5)	1.06 (0.75 to 1.49)
Partnership type			
Men who have sex with men only	657 (56.2)	68 (10.4)	Referent
Men who have sex with men and women	511 (43.7)	70 (13.7)	1.45 (1.04 to 2.21)
Lives with primary partner			
No	975 (83.4)	111 (11.4)	Referent
Yes	177 (15.1)	24 (13.6)	1.17 (0.73 to 1.78)

Continued

Table 1 Continued

Characteristic	Total (N=1169)	N (%)*, † with low social support (n=138)	RR (95% CI)
City			
Atlanta	207 (17.7)	18 (8.7)	Referent
New York City	256 (21.9)	38 (14.8)	1.61 (0.93 to 2.88)
Washington	177 (15.1)	9 (5.1)	0.58 (0.25 to 1.27)
Boston	173 (14.8)	24 (13.9)	1.75 (0.95 to 3.27)
Los Angeles	207 (17.7)	25 (12.1)	1.34 (0.73 to 2.49)
San Francisco	149 (12.7)	24 (16.1)	1.84 (1.00 to 3.44)

*Totals may not sum to 138 because of missing values.

†Low social support defined as lacking all forms of support at 12 months compared with having at least one form of support at 12 months.

HPTN, HIV Prevention Trials Network; RR, risk ratio.

we presented associations between recent incarceration at 6 months and social support at 12 months among those with and without baseline support in the tables and highlighted these differences in the text when observed.

RESULTS

Baseline characteristics among participants with low levels of social support

Of the analytical sample (N=1169), 14% participants reported recent incarceration at the 6-month follow-up, and 12% of participants were categorised as lacking all six forms of social support at 12 months follow-up. In table 1, we present associations between selected covariates (of those included in the IPTW) and low social support. Median age was 39 years and was not associated with low support. Compared with cisgender males, transgender females had approximately twice the risk of low social support (RR 1.94, 95% CI 0.99 to 3.42). Participants with unstable housing (RR 1.63, 95% CI 0.99 to 2.56), who dropped out of high school (RR 1.50, 95% CI 1.07 to 2.12) and with insufficient income (RR 1.84, 95% CI 1.29 to 2.66) had higher risk of low support. All the covariates measured as scales were included as such in the IPTW model but in order to illustrate the prevalence of low social support across levels of the scales, we created cut-points based on the median except for depression which is based on the validated cut-point of ≥ 16 .³⁵ Participants with depressive symptoms had approximately twice the risk of reporting low social support (RR 1.95, 95% CI 1.38 to 2.78). Racism, and experienced and internalised homophobia did not appear associated with low social support. Those who have sex with men and women had greater risk of reporting a lack of social support than those who have sex with men only (RR 1.45, 95% CI 1.04 to 2.21). Compared with those living in Atlanta, participants who lived in New York City, Boston and San Francisco had higher risk of low support while those in Washington DC appeared to have lower risk.

Associations between recent incarceration and subsequent social support

Continuous Social Support Score. Among all participants, the mean social support score at 12 months was 20.9 (data not shown in table). Recent incarceration was associated with a lower prevalence of subsequent support (table 2). Specifically, after adjustment, recent incarceration was associated with lower social support (adjusted β : -2.40, 95% CI -3.94 to -0.85). The relationship between recent incarceration and overall social support did not differ based on baseline social support.

Emotional and informational support. Approximately 19% of the sample reported lacking someone to talk and listen none or little of the time, 28% lacked someone to give advice, 22% lacked someone to provide emotional support and 23% lacked contact with someone they felt close to. Recent incarceration was associated with increased risk of lacking each of these forms of support (table 3). Those who were recently incarcerated had an approximately 50% higher risk of not having someone to talk and listen at 12 months (adjusted RR (aRR) 1.55, 95% CI 1.13 to 2.13). Participants who had been incarcerated in the past 6 months had increased risk of lacking someone who could give them advice (aRR 1.73, 95% CI 1.27 to 2.36). This association appeared stronger among those with that support at baseline (aRR 2.02, 95% CI 1.27 to 3.21). Similarly, recent incarceration was associated with increased risk of lacking someone to provide emotional support (aRR 1.50, 95% CI 1.14 to 1.99), and the relationship appeared stronger among those with that support at baseline (no baseline support aRR 1.23, 95% CI 0.91 to 1.66; baseline support aRR 1.83, 95% CI 1.19 to 2.82). Recent incarceration was associated with lacking contact with someone they felt close to (aRR 1.42, 95% CI 1.07 to 1.88).

Affectionate support. Approximately 21% of the sample reporting lacking affectionate support and incarceration was associated with a 50% increase in risk of lacking that form of support (aRR 1.51, 95% CI 1.11 to 2.04).

Table 2 Associations between recent incarceration* and overall social support at 12 months follow-up among the total sample and by baseline support level (N=1169)

Outcome	Total sample			Among those with no support at baseline			Among those with support at baseline			Unadj (adj) p value†			
	Mean (SD)	Median (min, max)	Beta (95% CI)	Adjusted beta† (95% CI)	Mean (SD)	Median (min, max)	Beta (95% CI)	Adjusted beta† (95% CI)	Mean (SD)		Median (min, max)	Beta (95% CI)	Adjusted beta† (95% CI)
	Max												
No recent incarceration	21.2 (7.21)	22.0 (6.0, 30.0)	Referent	Referent	15.4 (8.06)	15.0 (6.0, 30.0)	Referent	Referent	22.2 (6.61)	24.0 (6.0, 30.0)	Referent	Referent	0.38 (0.73)
Recent incarceration	18.9 (7.68)	18.0 (6.0, 30.0)	-2.61 (-4.01 to -1.21)	-2.40 (-3.94 to -0.85)	13.9 (7.40)	12.0 (6.0, 30.0)	-1.19 (-4.41 to 2.04)	-2.89 (-6.30 to 0.52)	19.9 (7.29)	19.0 (6.0, 30.0)	-2.73 (-4.19 to -1.21)	-2.24 (-3.78 to -0.69)	

*Recent incarceration defined as having been incarcerated within past 6 months.

†Adjusted beta is estimates obtained from models weighted using the inverse probability to treatment weight.
‡P value for difference in associations between those with and without support at baseline.

Tangible support. Approximately 36% of participants reported lacking someone to help with chores and incarceration did not appear to be associated (aRR 1.15, 95% CI 0.92 to 1.44).

Low overall social support. Recent incarceration was associated with approximately 1.8 times the risk of lacking all six forms of social support at 12 months (aRR 1.80, 95% CI 1.21 to 2.68). The association appeared stronger among those who had had support at baseline compared with those who had not in unadjusted analyses (no baseline support RR 1.14, 95% CI 0.70 to 1.86; baseline support RR 2.11, 95% CI 1.30 to 3.42) but the difference was not significant after adjustment (no baseline aRR 1.46, 95% CI 0.93 to 2.29; baseline support aRR 2.07, 95% CI 1.19 to 3.60).

DISCUSSION

In this sample of BSMM and BTW, those who had been incarcerated in the past 6 months were more likely to have lower levels of social support following incarceration, and to lack specific forms of social support. The negative impact of incarceration on some forms of support appeared stronger for those who had had support at baseline (ie, prior to the recent incarceration), which suggest that the incarceration may have contributed to a reduction in support among those where it had previously been present. Our results extend the body of literature demonstrating incarceration's detrimental impacts on support by highlighting these disruptive effects on support networks of BSMM and BTW, populations that are disproportionately exposed to criminal justice involvement. Findings suggest the importance of identifying opportunities for criminal justice reform and alternatives to incarceration to best protect support networks of BSMM and BTW, whose networks are critical to protecting well-being and health. Findings also highlight the need to help BSMM and BTW who are experiencing incarceration to maintain and strengthen support to promote successful community re-entry and improve health.

In this study, participants were reporting on incarceration occurring between baseline and the 6-month follow-up visit, and this brief reporting period suggests that these were likely short-term incarcerations in jail. Yet, we still found that these incarcerations conferred risk of lacking social support, supporting prior studies showing that incarceration of short duration has just as strong if not stronger adverse effects compared with longer detainments.⁴⁵ Considering that up to three-quarters of individuals in jails have not been convicted of a crime but are denied/unable to make bail, or have been charged with low-level offences,⁴⁶ this highlights the need for bail reform and to find alternatives to incarceration to prevent disruptive impacts on support that may have long-lasting collateral consequences. There is also a clear need for programming to maintain and foster support networks during incarceration, and programmes vary widely by state. Departments of correction characterise visitation as

Table 3 Associations between recent incarceration* and social support at 12 months follow-up among the total sample and by baseline support level (N=1169)

Outcome	Total sample			Among those with no support at baseline			Among those with support at baseline			Unadj (adj) p value†
	N (%) with Outcome	RR (95% CI)‡	ARR (95% CI)‡	N (%) with Outcome	RR (95% CI)	ARR (95% CI)‡	N (%) with Outcome	RR (95% CI)	ARR (95% CI)‡	
No one to talk and listen										
No recent incarceration	176 (17.5)	Referent	Referent	98 (39.8)	Referent	Referent	74 (10.1)	Referent	Referent	0.15 (0.57)
Recent incarceration	44 (26.7)	1.66 (1.26 to 2.20)	1.55 (1.13 to 2.13)	26 (47.3)	1.23 (0.91 to 1.66)	1.31 (0.96 to 1.78)	16 (15.4)	1.81 (1.15 to 2.86)	1.57 (0.90 to 2.74)	
No one to give advice										
No recent incarceration	162 (16.1)	Referent	Referent	84 (38.0)	Referent	Referent	76 (10.1)	Referent	Referent	0.02 (0.13)
Recent incarceration	46 (27.9)	1.86 (1.42 to 2.45)	1.73 (1.27 to 2.36)	21 (43.8)	1.26 (0.90 to 1.75)	1.30 (0.91 to 1.86)	23 (20.5)	2.27 (1.53 to 3.36)	2.02 (1.27 to 3.21)	
No one to provide emotional support										
No recent incarceration	207 (20.6)	Referent	Referent	112 (42.4)	Referent	Referent	89 (12.5)	Referent	Referent	0.02 (0.13)
Recent incarceration	52 (31.5)	1.60 (1.25 to 2.05)	1.50 (1.14 to 1.99)	24 (45.3)	1.15 (0.86 to 1.55)	1.23 (0.91 to 1.66)	26 (24.3)	2.01 (1.39 to 2.90)	1.83 (1.19 to 2.82)	
Not much contact with someone you feel close to										
No recent incarceration	224 (22.3)	Referent	Referent	131 (43.1)	Referent	Referent	86 (12.9)	Referent	Referent	0.22 (0.56)
Recent incarceration	51 (30.9)	1.48 (1.15 to 1.91)	1.42 (1.07 to 1.88)	31 (49.2)	1.18 (0.91 to 1.54)	1.22 (0.92 to 1.61)	17 (18.1)	1.62 (1.03 to 2.57)	1.44 (0.88 to 2.37)	
No one to give love and affection										
No recent incarceration	203 (20.2)	Referent	Referent	103 (37.7)	Referent	Referent	93 (13.3)	Referent	Referent	0.22 (0.34)
Recent incarceration	44 (26.7)	1.39 (1.05 to 1.86)	1.51 (1.11 to 2.04)	22 (44.0)	1.15 (0.82 to 1.61)	1.30 (0.94 to 1.82)	20 (18.7)	1.58 (1.04 to 2.41)	1.70 (1.07 to 2.70)	
No one to help with chores										
No recent incarceration	353 (35.2)	Referent	Referent	232 (48.4)	Referent	Referent	112 (22.5)	Referent	Referent	0.44 (0.94)
Recent incarceration	63 (38.2)	1.15 (0.94 to 1.40)	1.15 (0.92 to 1.44)	40 (50.6)	1.07 (0.86 to 1.33)	1.15 (0.90 to 1.47)	21 (26.2)	1.27 (0.87 to 1.86)	1.13 (0.74 to 1.72)	
Low social support§										
No recent incarceration	107 (10.7)	Referent	Referent	46 (31.1)	Referent	Referent	58 (7.0)	Referent	Referent	0.073 (0.336)
Recent incarceration	31 (18.8)	1.71 (1.19 to 2.45)	1.80 (1.21 to 2.68)	12 (40.0)	1.14 (0.70 to 1.86)	1.46 (0.93 to 2.29)	17 (13.2)	2.11 (1.30 to 3.42)	2.07 (1.19 to 3.60)	

*Recent incarceration defined as having been incarcerated within past 6 months.

†P value for difference in associations between those with and without support at baseline.

‡Adjusted beta is estimates obtained from models weighted using the inverse probability to treatment weight.

§Low social support defined as lacking all forms of support at 12 months compared with having at least one form of support at 12 months.

aRR, adjusted risk ratio; RR, risk ratio.

a 'privilege' and this may be further restricted for those seeking visitation from same-sex partners.⁴⁷ Finally, the only known intervention for criminal justice-involved couples, which seeks to enhance relationships to reduce STI/HIV risk, is focused on men in community corrections and female partners.⁴⁸

Recent incarceration was linked to lacking someone to give advice. Supportive networks that provide information and advice might be particularly important for BSMM and BTW, potentially even more so after incarceration. Support via provision of information and advice regarding employment and housing opportunities are vital for these groups as they re-enter society and re-establish themselves.^{14 49} Intersecting potential stigmas experienced as a racial and sexuality minority individual who has been incarcerated may exacerbate needs for advice regarding housing and employment during re-entry. It is unfortunately well documented that employers are often biased against hiring racial and/or sexual minorities,⁵⁰ and a criminal record may worsen this employment discrimination. Having social support to assist with housing and employment must be complemented by policy changes to reduce discrimination in these areas. We also found that those who were recently incarcerated had an almost 50% increase in risk of being without affectionate support. The majority of people have a romantic partner at prison entry,^{10 51} and partners are often a key source of support.⁴⁹ Disruption of these partnerships during incarceration and subsequently lacking emotional and affectionate support during re-entry is associated with risk of depression, substance use, and STI/HIV.⁸ Moreover, BSMM and BTW often describe family and friends as important sources of support,⁵² and family are vital for providing emotional support to individuals who are incarcerated,⁴⁹ possibly even more so than romantic partners.⁵³ Lacking this support could lead to increased risk for poor mental health, substance use, and involvement in exchange sex, thereby increasing risk of adverse outcomes including STI/HIV and risk for recidivism.⁵⁴

A major limitation of this study is that we are not able to determine who the people were providing support. Studies conducted in principally male samples of individuals who were incarcerated have found that specific people such as mother, sisters and romantic partners are often the most crucial sources of support and forms of support received from these sources differed.^{9 49 55} We also lack data regarding the level of communication with support networks during incarceration, including barriers to staying in touch. An additional limitation of our measure of social support is that the six-item scale is not validated, and the items included here as adapted from the MOS social support survey may not capture other dimensions or forms of social support that are important for the health and well-being of BSMM and BTW, and qualitative research is needed to understand this topic

and develop social support measures for this population. This information would improve understanding of how to best protect support networks of BSMM and BTW in the context of incarceration. We also do not know the reason for or length of the incarceration or how long since an individual was released, which may have differential impacts on support. HPTN 061 aimed to examine HIV prevention strategies for black gay, bisexual and other sexual minorities individuals when it was conducted approximately ten years ago; however, a small proportion of transgender women were recruited into the study sample. We lacked power to assess differences in associations between BSMM and BTW due to the small number of BTW but it is possible incarceration's impact on social support may differ in these groups and future research is needed. Measures were self-reported and lost to follow-up may have been greater for those with incarceration histories and/or low social support, potentially introducing information and selection bias, respectively. Also, considering the recruitment strategies of the parent study, generalisability may be limited.

This study is the first to our knowledge to demonstrate that incarceration may be associated with lower social support on re-entry among BSMM and BTW, populations that are unequally targeted for criminal justice involvement and potentially already at heightened risk for lacking support. We need future studies to examine how incarceration-induced reductions in social support may have downstream consequences on the health and well-being of these groups, which could inform prevention approaches seeking to reduce incarceration's adverse effects.

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