



HHS Public Access

Author manuscript

J Acquir Immune Defic Syndr. Author manuscript; available in PMC 2023 May 24.

Published in final edited form as:

J Acquir Immune Defic Syndr. 2022 February 01; 89(2): 159–165. doi:10.1097/QAI.0000000000002828.

Material Hardship and Association With Sexual Risk Behavior Among Adolescent Sexual Minority Males in 3 US Cities—National HIV Behavioral Surveillance—Young Men Who Have Sex With Men, 2015

Lindsay Trujillo, MPH^a, Taylor Robbins, MPH^b, Elana Morris, MPH^b, Catlainn Sionean, PhD^b, Christine Agnew-Brune, MPH, PhD^b, NHBS-YMSM Study Group

^aOak Ridge Institute for Science and Education, Oak Ridge Associated Universities, Oak Ridge, TN;

^bDivision of HIV Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA.

Abstract

Introduction: Adolescent sexual minority males (ASMMs) are disproportionately affected by HIV relative to other youth within the United States. Social determinants of health have been explored among this population; however, economic determinants, such as material hardship, remain understudied. We examined the relationship between material hardship and sexual behavior among ASMMs aged 13–18 years residing in 3 US cities using 2015 data from CDC’s National HIV Behavioral Surveillance among Young Men Who Have Sex with Men.

Methods: Young men ages 13–18 years residing in 3 US cities were recruited through venue-based, respondent-driven, or Facebook sampling. We estimated adjusted prevalence ratios (aPRs) with 95% confidence intervals (CIs) for condomless anal intercourse (CAI) with a male sex partner in the past 12 months and with having 4 or more male sex partners in the past 12 months.

Results: Of 547 ASMMs, 27% reported experiencing material hardship in the past 12 months. After adjusting for demographics, household characteristics, and city, ASMMs who experienced material hardship were more likely to report CAI with a male partner in the past 12 months (aPR: 1.55, 95% CI: 1.25 to 1.93) and to have had 4 or more male sex partners in the past 12 months (aPR: 1.44, 95% CI: 1.08 to 1.91).

Correspondence to: Lindsay Trujillo, MPH, NHBS Study Group, Division of HIV/AIDS Prevention National Center for HIV, Viral Hepatitis, STD, and TB Prevention Centers for Disease Control and Prevention, 8 Corporate Square Blvd NE, Atlanta, GA 30329 (ode2@cdc.gov).

The authors have no conflicts of interest to disclose.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

The data sets generated during and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Discussion: More than a quarter of ASMMs experienced material hardship that was associated with increased sexual risk behavior among ASMMs. Incorporating services that address all unmet needs is important to consider for HIV prevention efforts for ASMMs.

Keywords

material hardship; sexual behavior; adolescence; YMSM; NHBS

INTRODUCTION

Adolescent sexual minority males (ASMMs)—young men aged 13–24 years who identify as gay, bisexual, or who have sexual contact with or attraction to persons of the same sex—are disproportionately affected by HIV. In 2018, 21% of new HIV diagnoses in the United States and dependent areas were among youth aged 13–24 years, and 92% of diagnoses among young men were attributed to male-to-male sexual contact.¹ Characteristics associated with HIV prevalence among ASMMs include sexual behaviors such as condomless anal intercourse (CAI) and having multiple partners.² ASMMs are more likely to report these behaviors than their nonsexual minority counterparts.³ However, HIV prevalence is not parallel to reported sexual risk behavior by ASMM subgroups; although young (13–24 years) non-Hispanic Black and Hispanic/Latino men experience the highest rates of HIV diagnoses,¹ studies have found similar rates of sexual risk behavior across all racial/ethnic identities.⁴ Although male-to-male sexual contact is reported as the most common mode of transmission for young men aged 18 years and younger, the contrast between HIV prevalence and sexual behavior by race/ethnicity suggests that sexual risk behavior alone does not explain differences in HIV prevalence among subgroups of youth and may be part of the causal pathway of external factors that include sexual risk.

Social determinants of health, which include socioeconomic status (SES) and access to health care, are receiving increased attention and focus as part of social and structural inequalities that may explain observed health disparities.⁵ Socioeconomic conditions that have been previously explored include the association of poverty with HIV diagnoses⁶ and income and educational attainment with HIV risk behaviors.⁷ Exploring socioeconomic characteristics in conjunction with individual behaviors may provide a clearer picture of how sexual minority youth are at increased risk for HIV than individual behaviors alone.⁸ A systematic review found that young MSM ranging from age 16 to 30 years were more likely to have low SES and less likely to have access to HIV prevention services compared with their older counterparts.⁹ One study found that young men aged 18–29 years whose incomes were below the poverty line were more likely to report partner serodiscordance.¹⁰ Another study found that lower educational attainment was a predictor for increased CAI among Black men aged 29 years and younger but not for older Black men,¹¹ suggesting that socioeconomic characteristics may affect sexual risk behavior differently by age.

While income and education are recognized as key characteristics of SES, exploration of additional SES characteristics is needed to understand how social determinants play a role in observed disparities.¹² One characteristic, access to material resources, has been explored in households,¹³ but not specifically for households with ASMMs. However, key indicators

of low-income households, such as material hardship, have been found to be associated with adverse health outcomes among adults (age ≥ 18 years) and children 5–11 years old alike.^{14,15} As prevalence of material hardship is high among subgroups of youth,^{16,17} it may help explain health disparities among youth.

Material hardship is defined as conditions in which a household has insufficient financial resources to adequately meet personal or household needs and has been used to supplement income-based poverty measures.¹⁸ Material hardship has been identified as a mechanism of how SES contributes to health disparities by race/ethnicity¹⁹ and how poverty affects children's developmental outcomes.²⁰ Material hardship may be a better measure of experienced economic conditions for ASMMs because of challenges in collecting accurate household income from adolescents aged 11–16 years.²¹ Using material hardship as a measure can also capture the differences that cost of living contributes toward access to food or health care.²² Indices of material hardship, such as food insecurity and residential instability, are associated with low perception of health and access to care.^{23,24}

Although hardship characteristics have been assessed among adult MSM (ages >18 years), few studies have explored the relationship of individual hardship characteristics and HIV-related risk behaviors among ASMMs (aged 13–18 years). A study of MSM found high financial hardship was associated with increased sexual risk behavior²⁵ and substance use.²⁶ Among Black MSM, experiencing a worsening of financial status was found to be associated with having multiple male partners.²⁷ Among persons living with HIV, MSM reported condomless sex because of food insecurity, an indicator of hardship, as a means of survival.²⁸ For young Black MSM ages 16–29 years, food insecurity was found to be a strong predictor of sexual risk behavior.²⁹ Residential instability, another characteristic of hardship, was also found to be associated with CAI with a same-sex partner.³⁰ Emerging evidence of the relationship between hardship characteristics and sexual risk behavior outcomes suggests that material hardship may be an important risk factor for HIV.

As research focused on ASMMs moves toward structural indicators, further exploration of material hardship and its potential relation to sexual risk behavior is needed to comprehend key differences for outreach efforts in HIV prevention. To address the gap in the literature, we assessed whether there is an observed relationship between material hardship and sexual behavior among ASMMs (aged 13–18 years). Specifically, we assessed the association of material hardship and sexual risk behavior among ASMMs using data from the 2015 National HIV Behavioral Surveillance among Young Men Who Have Sex with Men (NHBS-YMSM).

METHODS

Young men aged 13–18 years were recruited and interviewed for NHBS-YMSM in 3 metropolitan statistical areas (MSAs): Chicago, IL; New York City, NY; and Philadelphia, PA. Participants were recruited using a combination of venue-based time-space sampling, respondent-driven sampling, and Facebook sampling.³ Eligibility for the study was assessed in-person, and trained interviewers reviewed informed consent/assent information with eligible participants. Waivers of parental consent for participants younger than 18 years were

obtained by each site for varying age groups (New York City ages 13–17 years; Philadelphia ages 14–17 years; and Chicago ages 16–17 years). All consenting/assenting participants were administered an anonymous survey with a trained interviewer and offered an HIV test. Anonymous HIV testing was offered to all participants regardless of self-reported HIV status. Participants were compensated \$25 for survey participation and \$25 for HIV testing. All NHBS-YMSM activities were approved by local institutional review boards in each city and by CDC. More details about sampling, recruitment, and measures are reported elsewhere.³ Participation was limited to cisgender males (reported male assigned sex at birth and identified as male) and indicated same-sex attraction, gay, bisexual, or same-gender-loving identity, or ever having had any sexual contact with a male. In addition, participants had to be residents of the MSA, able to provide informed consent/assent, and able to complete the interview in English.

Measures

The questionnaire included items on individual demographics, household characteristics, and sexual risk behaviors.

Exposure

Material hardship within the past 12 months was assessed with a composite variable based on household financial instability and forgone health care because of cost. Household financial instability was asked as the following with a yes/no response: “In the past 12 months, was there a time where there wasn’t enough money in your house for rent, food, or utilities such as gas, electric, or phone?” Forgone health care was asked as a yes/no question: “During the past 12 months, was there any time when you needed medical care but didn’t get it because it wasn’t affordable?” Because both items were assessed within the same period and asked on the condition of money or affordability, answering “yes” to either question was coded as having experienced material hardship in the past 12 months.

Demographics

To assess race/ethnicity, participants were asked whether they considered themselves to be Hispanic or Latino followed by another question that asked which racial group(s) they considered themselves to be part of. For race, participants were able to select more than 1 option. The response options were combined to create the following categories: Hispanic/Latino, non-Hispanic Black, non-Hispanic White, and non-Hispanic other racial group, which included Asian, American Indian or Alaskan Native, or multiple races. Sexual identity was assessed by asking whether the participant considered themselves to be heterosexual or “straight,” homosexual or gay, or bisexual.

Household Characteristics

Participants were asked the following about their household structure: “Who did you live with for most of your childhood?” Responses were collapsed to “two parent” if they reported both biological or adoptive parents or stepparent and biological parent, “one parent” if they reported either biological or adoptive mother or father only, and some “other” family structure if they reported biological grandparent(s) or other relative, foster parent(s), another

adult only, or some other living situation such as a group home. For parental education, the following question was asked: “What is the highest level of education that either of your parents or guardians completed?” Responses were collapsed to “high school graduate or less,” “some college or technical/vocational school,” or “having a college or graduate degree.” For health insurance, participants were asked whether they currently have health insurance or health care coverage. Participants who said “yes” were coded as currently had health insurance at the time of interview.

Sexual risk Behavior

We assessed whether participants self-reported sexual risk behavior by asking the following questions. Participants who reported ever having had any sex were asked the number of male partners they had oral or anal sex with in the past 12 months. They were then asked the number of male partners they had anal sex with in the past 12 months, and, subsequently, the number of male partners with whom they had anal sex without a condom in the past 12 months. CAI was defined by having anal sex without a condom with at least 1 male partner in the past 12 months.

Data Analyses

Eligible participants who consented to and completed the survey and did not report a previous HIV-positive test result were included in the analysis. Participants who reported a previous HIV diagnosis were excluded from the analysis because of small sample size and because sexual behavior may differ by perceived HIV status.³¹ The final sample size was 547 ASMMs. We conducted descriptive statistics of demographics and household characteristics as well as bivariate analyses of material hardship with sexual risk behavior. Log-linked Poisson regression models were used to estimate prevalence ratios and 95% confidence intervals (CIs). Models for each sexual behavior characteristic were adjusted for variables identified a priori, which include age, race/ethnicity, and city as well as parental education and household structure.

RESULTS

Of the 547 participants in the analysis, 27% of ASMMs reported having experienced material hardship in the past 12 months (Table 1). Fifteen percent were 13–15 years old, 58% 16–17 years old, and 27% 18 years old. Thirty-nine percent were non-Hispanic Black, 39% Hispanic/Latino, 17% non-Hispanic White, and 5% other, which include Asian, American Indian/Alaskan Native and multiple races. Among ASMMs in our sample, 64% self-identified as homosexual or gay, 34% bisexual, and 3% heterosexual or straight. Of the household characteristics, 46% reported a two-parent household, 44% reported a one-parent household, and 10% reported some other family structure. Thirty-two percent reported the educational attainment of either parent was high school graduate or less; 19% some college, technical, or vocational school; and 50% having a college or graduate degree. Ninety-four percent of participants reported having any health insurance while 6% reported not having any health insurance.

Table 2 presents bivariate analysis with material hardship and characteristics identified as potential confounders. By race/ethnicity, 28% of non-Hispanic Black ASMMs, 34% of Hispanic/Latino ASMMs, 22% of other non-Hispanic ASMMs, and 10% of non-Hispanic White ASMMs reported experiencing material hardship in the past 12 months ($P < 0.001$). By household structure, 21% of ASMMs who lived in a two-parent household, 32% of ASMMs who lived in a one-parent household, and 39% of ASMMs who lived in some other household reported material hardship in the past 12 months ($P = 0.003$). Seventeen percent of ASMMs who reported educational attainment of either parent as college degree or higher experienced material hardship while 36% of ASMMs who reported parental education as being some college, technical school, or vocational school experienced material hardship in the past 12 months; 37 percent of ASMMs who reported parental education as high school graduate or less experienced material hardship in the past 12 months ($P < 0.001$).

After adjustments for age, race/ethnicity, parental education, and household structure, participants experiencing material hardship in the past 12 months were more likely to report CAI with a male partner in the past 12 months compared with those not experiencing material hardship (55.0% vs 33.2%; aPR: 1.55, 95% CI: 1.25—1.93) (Table 3). Participants who experienced material hardship in the past 12 months were also more likely to have had 4 or more male sex partners in the past 12 months than those not experiencing material hardship (38.3% vs 25.6%; aPR: 1.44, 95% CI: 1.08—1.91) after adjustments. In addition, the parental education level of some college/technical/vocational school was associated with CAI with a male partner in the past 12 months compared with the parental education level of college degree or higher (50.5% vs. 33.2%; aPR: 1.34, 95% CI: 1.02—1.76). A *post hoc* analysis was conducted to assess parental education with CAI with a male partner, but findings were not significant when material hardship was removed from the models.

DISCUSSION

The purpose of this study was to assess the association between material hardship and sexual risk behavior among ASMMs. We found that more than a quarter of ASMMs experienced material hardship, which was associated with CAI with a male partner and having 4 or more male sex partners in the past 12 months after controlling for age, race/ethnicity, and household characteristics. The findings suggest that experiences of material hardship are important to consider for HIV prevention because it may help explain differences in an increased risk for HIV acquisition for ASMMs regardless of parental education and household structure.

This study demonstrates the importance of material hardship as a socioeconomic indicator for HIV prevention among ASMMs. Previous studies have shown the relationship of material hardship and sexual risk behavior among adult populations at risk for HIV, but this study is the first to assess this relationship among ASMMs. Previous studies have used different indicators of hardship, such as job loss²⁷ or mortgage payments,³² that may be more challenging for adolescents to accurately report. Material hardship can better capture the malleability of the environment of ASMMs, such as increasing expenses relative to household income.^{33,34} The observed relationship between material hardship and sexual risk behavior may serve as a starting point for the use of material hardship as a measure when

assessing associations with health-related risk factors and outcomes among ASMMs; it may also be a catalyst for the use of material hardship as a measure within the larger field of adolescent health research.

The material hardship construct for this study was a combination of 2 characteristics: forgone health care because of cost and household financial insecurity measured by the household not being able to pay for food, rent, or utilities. The 2 characteristics represent items of the family resource scale, where factors identified from a reliability and validity study indicate correlations with income among economically disadvantaged populations.³⁵ Although most of the sample had reported having health insurance, the event of foregoing health care because of cost likely occurred as a result of out-of-pocket health care costs surpassing coverage.^{36,37} In addition, higher economic stress has been positively associated with seeing a provider for sexual health care among sexual minority youth; however, it is also associated with not having a regular doctor.³⁸ Not having a regular doctor can impede timeliness of additional health services, which can lead to negative health outcomes, which in turn may incur out-of-pocket costs that bring financial distress.³⁹ Incorporating other necessities such as internet availability and clothing in future survey instruments would be beneficial in further developing the measure for ASMM-specific studies.

Furthermore, this analysis demonstrates the differences of experienced material hardship by key demographics including race/ethnicity. The data include a large representation of non-Hispanic Black and Hispanic/Latino ASMMs, who also reported higher prevalence of experiencing material hardship. This is reflective of the general population, in that Black and Hispanic/Latino populations have the highest poverty rates in the United States.⁴⁰ The observed effect of material hardship may also be attributed to perpetual income inequalities that affect Black and Hispanic/Latino populations.⁴¹ In addition, sexual risk behavior was similar across all race/ethnic groups, which is consistent with the literature in that the incidence of HIV is not solely attributed to behavior but because of structural-based inequalities that make minority ASMMs more vulnerable than their White counterparts.⁴² More research is needed to explore the influence of SES on ASMMs with more equitable representation from all racial/ethnic groups to further understand the relationship between SES and HIV risk.

Limitations

There are several limitations to the analysis. First, the sample of ASMMs is a convenience sample, so it cannot be considered representative of all ASMMs aged 13–18 years within the United States or the participating MSAs. Second, data were self-reported and may be subject to recall error and social desirability bias. Third, the study design was cross-sectional, so temporality cannot be established. Fourth, the material hardship construct is not comprehensive of all aspects that influence material hardship. For example, precarious housing⁴³ and economic dependence on sex partners⁴⁴ were not captured with the survey instrument. In addition, the survey instrument was only able to capture homelessness at the time of interview. Owing to a small sample size of participants reporting homelessness, meaningful statistical analyses could not be conducted; further inquiry on precarious housing experiences and economic dependence on sex partners would provide more context

to the experiences of ASMMs. Fifth, nuanced measures of sexual risk behavior, such as whether CAI was receptive or insertive, and other measures of social exposures, such as sexual communication between participants and their sex partners, were not adequately captured by the survey instrument. Previous research suggests that unequal power dynamics in relationships can promote circumstances where condoms or other protective interventions are not used.^{45,46} Incorporating such measures in the study and assessing the relationship with material hardship may provide additional context on how material hardship influences ASMMs.

Recommendations

Future HIV prevention programs must consider the challenges faced by marginalized populations, which include reduced access to resources.⁴⁷ Policies that affect access to basic necessities such as food and health care enable the social environments to perpetuate health inequities that contribute to HIV risk.²⁷ Owing to the growing evidence supporting the role of material hardship in HIV prevention, incorporating additional characteristics that address basic physiological needs would provide a more precise picture of how ASMMs are differentially affected. A way to address the basic needs of this population would be by implementing HIV prevention programs that include housing and food programs for families with children. Although findings from previous interventions have been promising,⁴⁸ integrating all basic needs is necessary to be effective.⁴⁹ Because experiences of material hardship among youth can vary by local policies, integrating HIV prevention efforts with other services that address unmet material resource needs may be beneficial.

CONCLUSIONS

Material hardship was related to a higher prevalence of CAI with a male partner and having 4 or more male sex partners among ASMMs after adjusting for key demographics and household characteristics. The findings contribute to emerging evidence of material hardship as a determinant for HIV risk among ASMMs. In addition, this study demonstrates the importance of the construct for adolescent health research going forward. The observed relationship between material hardship and higher prevalence of sexual risk behavior suggests the importance of incorporating material hardship within frameworks of equitable interventions for youth before or around the time of sexual debut. Further research on mechanisms through which material hardship influences sexual risk behaviors of ASMMs may better inform intervention programming for this population.

ACKNOWLEDGMENTS

The authors thank the local staff in our three funded cities (Chicago, New York City, and Philadelphia) and the young men who participated in this project.

Supported in part by an appointment to the Research Participation Program at the CDC administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the US Department of Energy and the CDC.

REFERENCES

1. Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/hiv/group/age/youth/index.html>.
2. Kann L, Olsen E, McManus T, et al. Sexual identity, sex of sexual contact, and health-related behaviors among students in grades 9–12 – United States and selected sites. *MWWR Surveill Summ.* 2015;65: 1–202.
3. Balaji AB, An Q, Smith JC, et al. NHBS for Young Men who have Sex with Men (NHBS-YMSM) study group. High Human Immunodeficiency Virus incidence and prevalence and associated factors among adolescent sexual minority males—3 cities. *Clin Infect Dis.* 2015;66:936–944.
4. Garofalo R, Mustanski B, Johnson A, et al. Exploring factors that underlie racial/ethnic disparities in HIV risk among young men who have sex with men. *J Urban Health.* 2010;87:318–323. [PubMed: 20155329]
5. Solar O, Irvin A. A conceptual framework for action on the social determinants of health. *Soc Determ Heal.* 2010;2:79.
6. Wiewel EW, Bocour A, Kersanske LS, et al. The association between neighborhood poverty and HIV diagnoses among males and females in New York City, 2010–2011. *Public Health Rep.* 2016;131:290–302. [PubMed: 26957664]
7. Stevens R, Icard L, Jemmott JB, et al. Risky trade: individual and neighborhood-level socio-demographics associated with transactional sex among urban African American MSM. *J Urban Health.* 2017;94: 676–682. [PubMed: 28766241]
8. Matthews DD, Smith JC, Brown AL, et al. Reconciling epidemiology and social justice in the public health discourse around the sexual networks of black men who have sex with men. *Am J Public Health.* 2016;106:808–814. [PubMed: 26890175]
9. Jefferies IVWL, Greene MK, Paz-Bailey G, et al. Determinants of HIV incidence disparities among young and older men who have sex with men in the United States. *AIDS Behav.* 2018;22:2199–2213. [PubMed: 29633094]
10. Bauermeister JA, Eaton L, Andrzejewski J, et al. Where you live matters: structural correlates of HIV risk behavior among young men who have sex with men in Metro Detroit. *AIDS Behav.* 2015;19:2358–2369. [PubMed: 26334445]
11. Maksut JL, Eaton LA, Siembida EJ, et al. An evaluation of factors associated with sexual risk taking among Black men who have sex with men: a comparison of younger and older populations. *J Behav Med.* 2016;39:665–674. [PubMed: 27001255]
12. Chaudry A, Wimer C. Poverty is not just an indicator: the relationship between income, poverty, and child well-being. *Acad Pediatr.* 2016;16: S23–S29. [PubMed: 27044698]
13. Schenck-Fontaine A, Panico L. Many kinds of poverty: three dimensions of economic hardship, their combinations, and children’s behavior problems. *Demography.* 2019;56:2279–2305. [PubMed: 31808103]
14. Charkhchi P, Fazeli Dehkordy S, Carlos RC. Housing and food insecurity, care access, and health status among the chronically ill: an analysis of the behavioral risk factor surveillance system. *J Gen Intern Med.* 2018;33:644–650. [PubMed: 29299816]
15. Yoo JP, Slack KS, Holl JL. Material hardship and the physical health of school-aged children in low-income households. *Am J Public Health.* 2009;99:829–836. [PubMed: 18703452]
16. Kipke MD, Kubicek K, Akinyemi IC, et al. The healthy young men’s cohort: health, stress, and risk profile of black and Latino young men who have sex with men (YMSM). *J Urban Health.* 2020;97:653–667. [PubMed: 32864727]
17. Sterrett EM, Dymnicki AB, Henry D, et al. Predictors of co-occurring risk behavior trajectories among economically disadvantaged African-American youth: contextual and individual factors. *J Adolesc Health.* 2014;55:380–387. [PubMed: 24755141]
18. Health, Human Services. Measures of Material Hardship. ASPE. Available at: <https://aspe.hhs.gov/execsum/measures-material-hardship>. Accessed July 17, 2020.
19. Hughes HK, Matsui EC, Tschudy MM, et al. Pediatric asthma health disparities: race, hardship, housing, and asthma in a national survey. *Acad Pediatr.* 2017;17:127–134. [PubMed: 27876585]

20. Hernández D, Jian Y, Carrión D, et al. Housing hardship and energy insecurity among native-born and immigrant low-income families with children in the United States. *J Child Poverty*. 2016;22:77–92. [PubMed: 27616875]
21. Svedberg P, Nygren JM, Staland-Nyman C, et al. The validity of socioeconomic status measures among adolescents based on self-reported information about parents occupation, FAS, and perceived SES; implication for health related quality of life studies. *BMC Med Res Methodol*. 2016;16:1–9. [PubMed: 26728979]
22. Huang J, Kim Y, Birkenmaier J. Unemployment and household food hardship in the economic recession. *Public Health Nutr*. 2016;19: 511–519. [PubMed: 26028335]
23. Tucker-Seeley RD, Harley A, Stoddard A, et al. Financial hardship and self-rated health among low-income housing residents. *Health Educ Behav*. 2014;40:442–448.
24. Gershoff ET, Aber JL, Raver CC, et al. Income is not enough: incorporating material hardship into models of income associations with parents and child development. *Child Dev*. 2007;78:70–95. [PubMed: 17328694]
25. Duncan DT, Park SH, Schneider JA, et al. Financial hardship, condomless anal intercourse and HIV risk among men who have sex with men. *AIDS Behav*. 2017;21:3478–3485. [PubMed: 29101606]
26. Park SH, Al-Ajlouni Y, Palamar JJ, et al. Financial hardship and drug use among men who have sex with men. *Subst Abuse Treat Prev Pol*. 2018; 13:19.
27. Nelson LE, Wilton L, Moineddin R, et al. Economic, legal, and social hardship associated with HIV risk among Black men who have sex with men in six U.S. cities. *J Urban Health*. 2016;93:170–188. [PubMed: 26830422]
28. Whittle HJ, Palar K, Napoles T, et al. Experiences with food insecurity and risky sex among low-income people living with HIV/AIDS in a resource-rich setting. *J Int AIDS Soc*. 2015;18:20293. [PubMed: 26546789]
29. Mena L, Crosby RA, Geter A. A novel measure of poverty and its associated with elevated sexual risk behavior among young Black MSM. *Int J STD AIDS*. 2017;28:602–607. [PubMed: 27389778]
30. Halkitis PN, Kapadia F, Siconolfi DE, et al. Individual, psychosocial, and social correlates of unprotected anal intercourse in a new generation of young men who have sex with men in New York City. *Am J Public Health*. 2013;103:889–895. [PubMed: 23488487]
31. Vasilenko SA, Rice CE, Rosenberger JG. Patterns of sexual behavior and sexually transmitted infections in young men who have sex with men. *Sex Transm Dis*. 2018;45:387–393. [PubMed: 29465677]
32. Ayala G, Bingham T, Kim J, et al. Modeling the impact of social discrimination and financial hardship on the sexual risk of HIV among Latino and Black men who have sex with men. *Am J Public Health*. 2012;102(Suppl 2):S242–S249. [PubMed: 22401516]
33. Cloud DH, Beane S, Adimora A, et al. State minimum wage laws and newly diagnosed cases of HIV among heterosexual Black residents of US metropolitan areas. *SMM Popul Health*. 2018;7:100327.
34. Zhang Q, Jones S, Ruhm CJ, et al. Higher food prices may threaten food security status among American low-income households with children. *J Nutr*. 2013;143:1659–1665. [PubMed: 23946342]
35. Ompad DC, Nandi V, Cerdá M, et al. Beyond income: material resources among drug users in economically-disadvantaged New York City neighborhoods. *Drug Alcohol Depend*. 2012;120:127–134. [PubMed: 21835561]
36. Yabroff KR, Zhao J, Han X, et al. Prevalence and correlates of medical financial hardship in the USA. *J Gen Intern Med*. 2019;34:1494–1502. [PubMed: 31044413]
37. Rodems R, Shafer HL. Many of the kids are not alright: material hardship among children in the United States. *Poverty Solutions* 2019. Available at: <https://files.eric.ed.gov/fulltext/ED611505.pdf>. Accessed July 23, 2020.
38. Newcomb ME, Moran K, Li DH, et al. Demographic, regional, and political Influences on the sexual health care experiences of adolescent sexual minority men. *LGBT Health*. 2020;7:28–36. [PubMed: 31750760]

39. Choi S Experiencing financial hardship associated with medical bills and its effects on health care behavior: a 2-year panel study. *Health Educ Behav.* 2018;45:616–624. [PubMed: 29117725]
40. Fontenot K, Semega J, Kollar M. Income and poverty in the United States: 2017. 2018 [Internet], United States Census Bureau, 2018. September Report No.: P60–263 Available at: <https://www.census.gov/content/dam/Census/library/publications/2018/demo/p60-263.pdf>.
41. Seider S, Clark S, Graves D, et al. Black and Latinx adolescents' developing beliefs about poverty and associations with their awareness of racism. *Dev Psychol.* 2019;55:509–524. [PubMed: 30802103]
42. Fiscella K, Williams DR. Health disparities based on socioeconomic inequities: implications for urban health care. *Acad Med.* 2004;79:1139–1147. [PubMed: 15563647]
43. Bauermeister JA, Eaton L, Meanley S, et al. Transactional sex with regular and casual partners among young men who have sex with men in the Detroit metro area. *Am J Mens Health.* 2017;11:498–507. [PubMed: 26438470]
44. Closson K, Smith RV, Olarewaju G, et al. Associations between economic dependence, sexual behaviours, and sexually transmitted infections among young, Black, gay, bisexual and other men who have sex with men living with and without HIV in Jackson, Mississippi, USA. *Sex Health.* 2018;15:473–476. [PubMed: 30111483]
45. Ricks JM, Crosby RA, Mena L. Relationship power and HIV risk among young Black men who have sex with men in the southern United States. *Sex Health.* 2018;15:292–297. [PubMed: 29709213]
46. Arrington-Sanders R, Leonard L, Brooks D, et al. Older partner selection in young African-American men who have sex with men. *J Adolesc Health.* 2013;52:682–688. [PubMed: 23523311]
47. Peterson JL, Jones KT. HIV prevention for black men who have sex with men in the United States. *Am J Public Health.* 2009;99:976–980. [PubMed: 19372510]
48. Kidder DP, Wolitski RJ, Royal S, et al. Access to housing as a structural intervention for homeless and unstably housed people living with HIV: rational methods, and implementation of the housing and health study. *AIDS Behav.* 2007;11:149–161. [PubMed: 17546496]
49. Brothers S, Lin J, Schonberg J, et al. Food insecurity among formerly homeless youth in supportive housing: a socio-ecological analysis of a structural intervention. *Soc Sci Med.* 2020;254:112724.

TABLE 1.

Characteristics of Adolescent Sexual Minority Males, 3 US Cities, National HIV Behavioral Surveillance—Young Men Who Have Sex With Men, 2015

	No.	(%)
Overall	547	100.0
Age groups (yr)		
13–15	81	14.8
16–17	318	58.1
18	148	27.1
Race/ethnicity		
Black, non-Hispanic	212	38.8
Hispanic/Latino [*]	215	39.4
White, non-Hispanic	92	16.9
Other [†]	27	5.0
Sexual identity		
Homosexual or gay	343	63.5
Bisexual	182	33.7
Heterosexual or straight	15	2.8
City		
Chicago	225	41.1
New York City	226	41.3
Philadelphia	96	17.6
Household structure [‡]		
Two parent	252	46.1
One parent	238	43.5
Other [§]	57	10.4
Parental education		
High school graduate or less	171	32.0
Some college/technical school/vocational school	99	18.5
College or graduate degree	265	49.5
Currently have health insurance		
Yes	506	94.2
No	31	5.8
Material hardship [¶] in the past 12 mo		
Yes	149	27.4
No	395	72.6

Percentages may not add to 100 because of rounding.

^{*} Hispanic/Latino participants can be of any race.

[†] Other category is composed of Asian (55.6%), American Indian/Alaskan Native (11.1%), and multiple races (33.3%).

[‡] Household structure in which the participant lived for most of their childhood.

[§]Category includes grandparents, other relatives, foster parent(s), group home, and dormitory.

^{//}Highest educational attainment of either parent or guardian.

[#]Participant's household had forgone food/rent/utilities or the participant had foregone health care because they could not afford it.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

TABLE 2.

Demographics and Household Characteristics by Material Hardship in the Past 12 months Among Adolescent Sexual Minority Males, 3 US Cities, National HIV Behavioral Surveillance–Young Men Who Have Sex With Men, 2015

	Overall	Material Hardship in the Past 12 mo [*]		$\chi^{2\dagger}$
	No.	n	%	
Overall	547	149	27.4	—
Race/Ethnicity				<0.001
Black, non-Hispanic	212	59	27.8	
Hispanic/Latino [‡]	215	74	34.4	
White, non-Hispanic	92	9	9.8	
Other [§]	27	6	22.2	
Household structure				0.003
Two parent	252	52	20.6	
One parent	238	75	31.5	
Other [¶]	57	22	38.6	
Parental education [#]				<0.001
High school graduate or less	171	64	37.4	
Some college/technical school/vocational School	99	36	36.4	
College or graduate degree	265	46	17.4	

^{*} Participant's household had forgone food/rent/utilities or the participant had foregone health care because they could not afford it.

[†] P values calculated from the Wald χ^2 analysis.

[‡] Hispanic/Latino can be of any race.

[§] Other category is composed of Asian, American Indian/Alaskan Native, and multiple races.

^{||} Household structure in which the participant lived for most of their childhood.

[¶] Category includes grandparents, other relatives, foster parent(s), group home, and dormitory.

[#] Highest educational attainment of either parent.

TABLE 3. Demographics and Household Characteristics by Material Hardship in the Past 12 months Among Adolescent Sexual Minority Males, 3 US Cities, National HIV Behavioral Surveillance—Young Men Who Have Sex With Men, 2015

	CAI with a Male Partner			4 Male Sex Partners		
	Prev. (%)	aPR (95% CI)	P	Prev. (%)	aPR (95% CI)	P
Material hardship in the past 12 mo						
Yes	55.0	1.55 (1.25–1.93)	<0.001	38.3	1.44 (1.08–1.91)	0.013
No	33.2	REF		25.6	REF	
Race/ethnicity						
Black, non-Hispanic	38.7	0.95 (0.67–1.34)	0.755	30.2	1.19 (0.75–1.88)	0.461
Hispanic/Latino	41.9	1.00 (0.71–1.41)	0.987	28.4	1.08 (0.69–1.71)	0.733
White, non-Hispanic	35.9	REF		25.0	REF	
Other, non-Hispanic [*]	33.3	1.00 (0.57–1.73)	0.987	37.0	1.51 (0.83–2.75)	0.181
Household structure [†]						
Two parent	35.3	REF		29.4	REF	
One parent	42.9	1.23 (0.97–1.55)	0.091	26.0	0.87 (0.64–1.18)	0.366
Other [‡]	42.1	1.21 (0.86–1.71)	0.272	40.3	1.30 (0.87–1.94)	0.199
Parental education [§]						
High school graduate or less	42.1	1.15 (0.89–1.49)	0.291	28.6	0.96 (0.70–1.33)	0.823
Some college/technical school/vocational school	50.5	1.34 (1.02–1.76)	0.034	35.3	1.17 (0.82–1.67)	0.383
College or graduate degree	33.2	REF		27.5	REF	

Models were adjusted for variables listed in the table in addition to age and city.

^{*} Other, non-Hispanic category is composed of Asian, American Indian/Alaskan Native, and multiple races.

[†] Household structure in which the participant lived for most of their childhood.

[‡] Category includes grandparents, other relatives, foster parent(s), group home, and dormitory.

[§] Highest educational attainment of either parent.