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Structural stigma and sexual orientation-related reproductive health disparities in a longitudinal cohort study of female adolescents

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Abstract

Introduction: Sexual minority female adolescents have worse reproductive health than heterosexual peers; research into the origins of these disparities is limited. Our objective was to examine whether exposure to structural stigma (e.g., societal-level conditions, cultural norms, institutional policies/practices that constrain the lives of the stigmatized) is associated with sexually transmitted infections (STIs) and teen pregnancy in sexual minority female adolescents.

Methods: Longitudinal data were utilized from 6,581 female adolescents aged 9- 14 years at baseline (1996) in the U.S.-based Growing Up Today Study and followed through 2007. We used a

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previously-validated structural stigma scale composed of four state-level items (e.g., employment non-discrimination policies) with one item added relevant to reproductive health. Risk ratios were generated from multivariate models.

Results: Sexual minority female adolescents were significantly more likely than heterosexual peers to have an STI diagnosis and teen pregnancy. Sexual minority female adolescents living in states with lower, compared to higher, levels of structural stigma were significantly less likely to have an STI diagnosis, after adjustment for individual- and state- level covariates (relative risk [RR]=0.70, 95% confidence interval [CI]: 0.51, 0.97). In contrast, among completely heterosexual adolescents, structural stigma was not associated with STI diagnosis. Teen pregnancy risk—a rare outcome—did not vary by level of structural stigma for sexual minority or heterosexual adolescents.

Conclusions: Structural stigma is a potential risk factor for adverse reproductive health among sexual minority female adolescents. Changing laws and policies to be inclusive of all people, regardless of sexual orientation, can help alleviate entrenched reproductive health disparities.

Keywords

Structural stigma; public policy; sexual minorities; sexually transmitted infections; teen pregnancy

INTRODUCTION

Compared to heterosexuals, sexual minority (SM) female adolescents have poorer reproductive health, including higher rates of sexually transmitted infections (STI) and teen pregnancy (Charlton et al., 2018; Williams & Chapman, 2011). Research into the origins of these disparities is limited.

Emerging research shows the health of SMs can be adversely affected by structural stigma, defined as “societal-level conditions, cultural norms, and institutional policies and practices that constrain the lives of the stigmatized” (Hatzenbuehler & Link, 2014). For instance, sexual orientation disparities in psychiatric morbidity are larger in states with structural stigma against SMs (Hatzenbuehler & Link, 2014). However, little is known about the role of structural stigma in reproductive health.

Our objective was to examine whether exposure to structural stigma is associated with STIs and teen pregnancy in SM female adolescents. We hypothesized that SM female adolescents living in high structural stigma environments would be more likely to experience an STI and teen pregnancy compared to SM female adolescents living in low structural stigma environments.

METHODS

Study Population

The Growing Up Today Study (GUTS) began in 1996 when participants from the Nurses' Health Study 2 enrolled their offspring, 9-14 years, into a longitudinal cohort study. The current analysis was limited to U.S.-based female GUTS participants who reported their sexual orientation and information on STIs and teen pregnancies between 1996-2007

(N=6,581). The study protocol was approved by the Institutional Review Boards of the Brigham and Women's Hospital and the Harvard T.H. Chan School of Public Health.

Measures

Sexual orientation—Sexual orientation has been collected on every GUTS questionnaire starting in 1999 using an item adapted from the Minnesota Adolescent Health Survey (Remafedi, Resnick, Blum, & Harris, 1992), which asks about feelings of attraction and sexual orientation identity. The item reads “Which of the following best describes your feelings?” with the response options: completely heterosexual (attracted to persons of the opposite sex), mostly heterosexual, bisexual (equally attracted to men and women), mostly homosexual, completely homosexual (gay/lesbian, attracted to persons of the same sex), and not sure. Sexual orientation groups were modeled using 2001 data, the closest in proximity to the structural stigma measurement. We combined the sexual minority subgroups (i.e., mostly heterosexual, bisexual, mostly/completely homosexual) and compared them to the reference group of completely heterosexual; we also conducted sensitivity analyses comparing each individual subgroup (e.g., mostly heterosexual) to the reference group in order to examine potential heterogeneity across subgroups. Participants who responded with “not sure” were excluded. If sexual orientation data were missing, they were imputed from pre-2001 responses.

Structural stigma—We used a previously-validated structural stigma scale (Hatzenbuehler, Jun, Corliss, & Austin, 2014), composed of four state-level items with one item added relevant to reproductive health: 1) density of same-sex partner households from the 2000 U.S. Census (Gates & Ost, 2004); 2) proportion of high schools with gay-straight alliances; 3) a composite variable of five state-level protective policies related to sexual orientation (e.g., employment non-discrimination policies); 4) public opinion toward sexual minorities using aggregated responses from 41 national polls from the Roper Center's iPol archive between 1999-2008 (Lax & Phillips, 2009); and 5) percent of women without an abortion provider in their county based on the 2001-2002 Guttmacher Institute survey of all known providers (Finer & Henshaw, 2002). A previous factor analysis (Hatzenbuehler et al., 2014) for the original four items, as well as an additional analysis with the fifth item, indicated a single-factor solution provided adequate fit so these items were all standardized and summed. Higher scores indicated more supportive social climates and therefore less structural stigma. State of residence was assessed from the participant's home address in the year 2000.

Sexually transmitted infections and teen pregnancy—Research on sexual orientation-related reproductive health disparities has primarily focused on STIs and teen pregnancies; given this literature and the available GUTS data, we similarly focused on these outcomes. In 1999, 2005, and 2007, participants were asked: “Have you ever been told by a doctor or other health care provider you have a sexually transmitted disease or STD? (For example: chlamydia, HPV infection, genital herpes, gonorrhea, genital warts, pubic lice or crabs, syphilis, HIV or AIDS.)” All STIs were collapsed together due to limited statistical power across sexual orientation groups. Lifetime histories of pregnancy were collected in

1999 and each subsequent questionnaire has asked about current pregnancies. Any pregnancy that occurred before age 20 years was categorized as a teen pregnancy.

Confounders—Individual-level confounders included age (in years), race/ethnicity (White, another race/ethnicity), and childhood socioeconomic position (based on annual household income from the mother's report in 2001 [$< \$50,000$; $\$50,000$ – $\$74,999$; $\$75,000$ – $\$99,999$; $\$100,000$]). State-level confounders included income inequality [ratio of the top fifth to the bottom fifth of household income for each state using 1998–2000 Census data (Bernstein, McNichol, & Mishel, 2000)] and median household income (using 2000 Census data). State-level prevalence of STIs [using the 2000 Centers for Disease Control and Prevention [CDC] STI surveillance of Chlamydia infections (Centers for Disease Control and Prevention, 2001)] and teen pregnancies [based on the Guttmacher Institute's 2000 report (Guttmacher Institute, 2004)] were used in each of their respective analyses. If data were missing for potential confounders, they were imputed from previous questionnaires; if no such data were available, multiple imputation procedures were used.

Statistical Analysis

We examined the longitudinal association between structural stigma in 2001 and any subsequent experiences of STIs and teen pregnancy across sexual orientation groups. We used log-binomial models with generalized estimating equations to account for repeated measures and sibling clusters resulting in risk ratios and 95% confidence intervals. Additionally, we conducted a sensitivity analysis excluding participants who were not sexually active and another sensitivity analysis excluding participants without male sexual partners in their lifetime. All analyses were conducted using SAS 9.4 (SAS Institute, Cary, NC).

RESULTS

SM female adolescents were significantly more likely than heterosexual peers to have an STI diagnosis (26.9% among SMs versus 14.5% among heterosexuals) and teen pregnancy (7.0% versus 3.2%). SM female adolescents living in states with low levels of structural stigma (score < 0 , versus high scores ≥ 0) were significantly less likely to have an STI diagnosis, after adjustment for individual- and state-level covariates (relative risk [RR]=0.70, 95% confidence interval [CI]: 0.51, 0.97). In contrast, among completely heterosexual adolescents, structural stigma was not associated with STI diagnosis. Teen pregnancy risk—a rare outcome—did not vary by level of structural stigma for SM or heterosexual adolescents. All results were consistent when stratified across SM subgroups. Results were also consistent after restricting the analysis to participants who were sexually active as well as after restricting to participants who had male sexual partners at some point in their lifetime.

DISCUSSION

SM female adolescents living in states with high levels of structural stigma were more likely to have an STI compared to SM adolescents living in low structural stigma states. The role of structural stigma in contributing to STI risk appeared unique to SMs; heterosexuals living

in high structural stigma states were no more likely to have an STI than were those in low structural stigma states. This finding improves the strength of our inferences, given that structural stigma related to minority sexual orientation should not affect reproductive outcomes among heterosexual women. There was no association between structural stigma and teen pregnancy, which may have been due to limited statistical power given the rarity of teen pregnancy among U.S.-based adolescents in the 1990s and 2000s. Future research is needed to identify the mechanisms through which structural stigma might operate to confer STI risk including access to condoms (Charlton et al., 2019).

Our findings are in line with previous studies about structural stigma among SM men. Two studies suggest structural stigma adversely influences SM male sexual health (Oldenburg et al., 2015; Pachankis et al., 2015) and a previous analysis of the GUTS cohort identified structural stigma as a risk factor for cigarette smoking among SM adolescents (Hatzenbuehler et al., 2014). Our findings extend this literature by examining the reproductive health of SM women.

Limitations of the study include a sample of adolescents that is predominantly White and children of nurses, limiting generalizability. STIs and teen pregnancies may have been unreported for a number of reasons, including stigma. Future research should explore other reproductive health outcomes beyond STIs and teen pregnancy as well as explore other dimensions of sexual orientation in more depth (e.g., sex of sexual partners). Some of the structural stigma measures (e.g., state-level attitudes) aggregated data across several years and may have been concurrent to, rather than prior to, the reproductive health outcomes. Data were limited to participants' adolescent years in the early and mid 2000s, so future studies should include adolescents coming of age today in the current political and social realities. Nonetheless, the detailed, longitudinal data on sexual orientation and reproductive health along with place of residence represent important strengths. To our knowledge, this is the first study to examine the role of structural stigma in the reproductive health of SM women.

Structural environments surrounding SMs are highly variable across U.S. states and dynamic across time. Therefore, this research is vital for understanding how these rapidly shifting environments may affect the health of SMs, including their reproductive health. Changing laws and policies to be inclusive of all people, regardless of sexual orientation, can help alleviate entrenched reproductive health disparities.

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Table 1.

Demographics, reproductive health, state-level covariates, and structural stigma by sexual orientation in the Growing Up Today Study, 1999-2007 (N=6,581).

Demographics	Completely Heterosexual		Sexual Minority¹		p³
	(N=5,835, 88.7%)		(N=746, 11.3%)		
Age at baseline, mean years (SD), Range: 12-19	14.6	(1.6)	15.0	(1.6)	<0.0001
White race/ethnicity, % (N)	93.8	(5,453)	90.8	(672)	0.002
Socioeconomic position, childhood annual household income ² , % (N)					0.07
<\$50 000	12.6	(596)	15.7	(97)	
\$50 000-\$74 999	24.1	(1,143)	23.4	(145)	
\$75 000-\$99 999	22.5	(1,064)	19.0	(118)	
>\$100 000	40.9	(1,937)	41.9	(260)	
Reproductive health outcomes					
STI diagnosis, % (N)	14.5	(802)	26.9	(193)	<0.0001
Teen pregnancy, % (N)	3.2	(180)	7.0	(51)	<0.0001
State-level covariates					
Income inequality ⁴ , mean (SD)	7.9	(1.1)	8.1	(1.1)	<0.0001
Household income ⁵ , median dollars (SD)	42 650	(4,013)	42 907	(4,085)	0.10
STI diagnosis ⁶ , mean rate per 100 000 women (SD)	386.2	(76.7)	384.7	(78.6)	0.63
Teen pregnancy ⁷ , mean rate per 1,000 women (SD)	79.5	(14.3)	81.3	(14.3)	0.001
Structural stigma ⁸					
Five-item scale, mean (SD)	0.7	(2.4)	1.1	(2.5)	0.001
Association of low vs. high structural stigma ⁹ and reproductive health					
STI diagnosis, risk ratio (95% CI)	0.91	(0.78, 1.07)	0.70	(0.51, 0.97)	
Teen pregnancy, risk ratio (95% CI)	0.76	(0.54, 1.09)	0.97	(0.52, 1.81)	

¹Sexual minorities include mostly heterosexual, bisexual, mostly/completely homosexual.

²Participants with missing demographic information are not listed in those categories.

³Chi square for categorical variables and t-tests for continuous variables were used to calculate *p* values comparing each sexual minority group to the reference group.

⁴Income equality is the ratio of the top fifth to the bottom fifth income by state from the 2000 U.S. Census.

⁵Median household income at the state level from the 2000 U.S. Census.

⁶State-level rate of the most commonly reported STI (i.e., Chlamydia) per 100 000 women from the CDC's STI 2000 surveillance report.

⁷State-level rate of teen pregnancy per 1,000 women from a 2000 Guttmacher Institute report.

⁸Structural stigma is a four-item combined measure [(1) density of same-sex partner households, (2) proportion of high schools with Gay-Straight Alliances, (3) a composite variable of five state-level policies related to sexual orientation, (4) public opinion toward sexual minorities] with one additional item added relevant to reproductive health [(5) percent of women without an abortion provider in their county]. Scale was reverse coded such that high scores indicate low structural stigma (five-item scale range: -4.7 to 6.8).

⁹Comparing individuals living in states with low stigma (based on five-item structural stigma scale<0) versus those living in states with high stigma (scale = 0). Adjusted for individual-level covariates (age, race/ethnicity, and socioeconomic position [based on childhood annual household income] and state-level covariates (income equality, median household income, and prevalence of the respective reproductive health outcome [i.e., STI, teen pregnancy]). Multiple imputation was used during analyses for any missing covariate data.

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