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# The Association of LGBTQ-Supportive School Health Policies and Practices with Sexual Health Outcomes

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## Abstract

**Purpose:** We examined the association of lesbian, gay, bisexual, transgender, and questioning (LGBTQ)-supportive school policies and practices with sexual health outcomes among LGB and heterosexual students.

**Methods:** The 2014 and 2016 School Health Profiles data from principals and lead health educators from 117 high schools in 16 local education agencies across the United States assessed LGBTQ-supportive school policies and practices (e.g., having a gay/straight alliance or similar club). The 2015 and 2017 Youth Risk Behavior Survey data from 75,638 students from the same schools assessed sexual health outcomes (e.g., being currently sexually active). We conducted multilevel cross-sectional logistic regression analyses to examine the associations between school-level LGBTQ-supportive policies and practices with student-level sexual health outcomes, while controlling for sex, grade, race/ethnicity, and school priority status.

**Results:** Several LGBTQ-supportive school policies and practices were significantly associated with lower odds of sexual risk behaviors (e.g., having four or more lifetime sexual partners) and ever being tested for human immunodeficiency virus (HIV) among both LGB and heterosexual students but not with using a condom during last sexual intercourse among sexually active gay, bisexual, or heterosexual male students. Having a greater number of LGBTQ-supportive school policies and practices was significantly associated with lower odds of ever having sex for LGB students and with sexual risk behaviors and ever being tested for HIV for heterosexual students.

**Conclusion:** The study highlights the relationship between multifaceted LGBTQ-supportive school policies and practices and improving sexual health outcomes among both LGB and heterosexual students.

**Keywords:** LGB youth, LGBTQ-supportive school policies, sexual health, student health disparities, student health outcomes

## Introduction

PAST RESEARCH INDICATES that LGB youth are more likely to engage in risky sexual behaviors and report adverse sexual health outcomes than their heterosexual peers.<sup>1-4</sup> According to the minority stress model, these differences are due to unique identity-related stressors that sexual and gender minority youth often experience in adolescence.<sup>5-7</sup> For example, lesbian and bisexual women often experience bias and assumptions about their sexuality in their sexual health education and access to sexual health services, which result in their increased risk for unintended pregnancy or sexually transmitted infections (STIs) compared to heterosexual women.<sup>4,8</sup> Similarly, gay and bisexual men experi-

ence more barriers to testing for human immunodeficiency virus (HIV) and other STIs than their heterosexual peers, contributing to their higher rates of HIV and other STIs.<sup>3,9</sup> Bisexual youth are particularly at risk for adverse sexual health outcomes due to the lack of medical attention and cultural misconceptions about bisexuality.<sup>10,11</sup>

School-based lesbian, gay, bisexual, transgender, and questioning (LGBTQ)-supportive health policies and practices contribute to a positive school climate and provide resources and support for sexual and gender minorities, including LGB students, which in turn protects them against identity-related stressors and adverse health outcomes.<sup>12-15</sup>

For example, student-led organizations known as gay-straight or gender-sexuality alliances (GSAs) improve relations among

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students and reduce bullying in school.<sup>16–18</sup> LGB youth who attend schools with such organizations report lower rates of sexual risk behaviors and adverse sexual health outcomes than LGB youth in schools without them.<sup>16–18</sup>

Further research identifies other LGBTQ-supportive school policies and practices that foster safer school environments and supportive social networks for sexual and gender minorities, including LGB youth: identifying safe spaces, prohibiting harassment based on sexual and gender identity, providing LGBTQ-relevant curricula or supplementary materials, and facilitating access to LGBTQ-competent out-of-school health, social, and psychological services.<sup>13,15,19</sup> In turn, LGB students in schools with such policies report lower rates of sexual risk behaviors and adverse sexual health outcomes compared to LGB students in schools without them, with bisexual youth often reporting the most significant improvements.<sup>13,15,19</sup>

The association between school policies and practices and improved health outcomes is not limited to policies and practices specifically focused on sexual and gender minority youth. For instance, encouraging staff to attend professional development on safe and supportive school environments for all students is also linked to improvements in school climate and, consequently, lower rates of sexual risk behaviors and adverse health outcomes for sexual and gender minorities, including LGB students.<sup>13,19,20</sup>

The benefits of LGBTQ-supportive school policies and practices are also associated with decreased health risk behaviors among heterosexual students.<sup>13,17,19</sup> However, most of this research examines LGBTQ-supportive school policies and practices individually instead of exploring their combined associations. Therefore, the following study examines the relationship between LGBTQ-supportive school policies and practices and sexual health outcomes among LGB and heterosexual students by analyzing both their individual and combined associations. We explored the relationship between these policies and practices and other health outcomes, such as high-risk substance use and suicide-related behaviors, in a separate study.<sup>21</sup> We address the existing gaps in research by exploring (1) the association between individual school-level LGBTQ-supportive policies and practices and student-level sexual health outcomes; and (2) the association between the sum of multiple LGBTQ-supportive school policies and practices and sexual health outcomes, both separately for LGB and heterosexual students.

## Methods

The current study integrates two data sources as follows: School Health Profiles (Profiles) and the Youth Risk Behavior Survey (YRBS). As part of the Centers for Disease Control and Prevention (CDC)'s Division of Adolescent and School Health (DASH) school health program implemented from 2013 to 2018, funded local education agencies (LEAs) collected Profiles and YRBS data biennially, in alternate years: Profiles in 2014 and 2016<sup>22,23</sup> and the YRBS in 2015 and 2017.<sup>24,25</sup> The data used in the analysis reflect the recommended program activities, and the analysis was restricted to the years in which the DASH program was implemented.

For Profiles, principals and lead health education teachers completed self-administered questionnaires assessing health

policies and practices in their schools.<sup>22,23</sup> The YRBS was administered to a nationally representative sample of secondary school students across the United States and assessed the prevalence of health risk behaviors among students and trends in such behavior over time.<sup>24,25</sup> Additional information about participant recruitment, data collection and weighting, and response rates are available in the overview and method reports.<sup>22,23,26</sup>

We merged the Profiles school-level data on LGBTQ-supportive policies and practices with the YRBS student-level data on sexual health outcomes, matching them by school and district. When using single-cycle data, several outcomes indicated nonconvergence or did not meet the recommended sample size for logistic regressions (i.e., at least 10 cases per outcome for each independent variable in the model).<sup>27</sup> Therefore, we combined data from multiple collection cycles, linking 2014 Profiles data with 2015 YRBS and 2016 Profiles with 2017 YRBS.

We only included schools from the 17 funded LEAs that completed Profiles in 2014 and 2016 and the YRBS in 2015 and 2017. We further excluded one LEA that did not meet the criterion of at least 60% overall response rate. The final analytic sample consisted of 75,638 students from 248 schools in 16 LEAs: 38,109 students in 2015 (14.4% of all YRBS students for that year) and 37,529 (15.0%) in 2017. The final sample constituted a 59% reduction from 607 schools from the funded LEAs that completed the YRBS in 2015 and a 61% reduction from 638 schools that completed the 2017 YRBS. Compared to the original Profiles dataset, the final sample was reduced by 51% from 504 schools in 2014 and by 56% from 569 schools in 2016.

The data were cross-sectional and did not include any repeat respondents. We did not weight the data, as our sample was not nationally representative. CDC's Institutional Review Board approved the protocol for the YRBS. Survey procedures were designed to protect students' privacy by allowing for anonymous and voluntary participation. Before survey administration, local parental permission procedures were followed. During survey administration, students completed the self-administered questionnaire during one class period and recorded their responses directly on a computer-scannable booklet.

As a surveillance system, School Health Profiles has been determined to be exempt from review by the CDC Institutional Review Board. Some individual states and school districts, however, have chosen to submit their Profiles surveys for review; approval has been granted in all of these cases.

## Measures

YRBS assesses sexual identity with the following question: "Which of the following best describes you?" Response options include "heterosexual (straight)," "gay or lesbian," "bisexual," and "not sure." We combined "gay or lesbian" and "bisexual" responses to form a single group for LGB students, allowing us to have a sample size large enough to meet the minimum requirements for logistic regressions.<sup>27</sup> Finally, we excluded 4162 students (5.3% of the original sample) who responded "not sure" because of the possibility that this response option was selected by students who did not know what the question or other response options meant.<sup>28</sup> Surveys used in this study did not include

TABLE 1. LESBIAN, GAY, BISEXUAL, TRANSGENDER, AND QUESTIONING-SUPPORTIVE SCHOOL POLICIES AND PRACTICES—2014 AND 2016 SCHOOL HEALTH PROFILES

<i>Policy/practice</i>	<i>Profile question</i>	<i>Schools (n=491)</i>
Gay/straight alliance	Does your school have a student-led club that aims to create a safe, welcoming, and accepting school environment for all youth, regardless of sexual orientation or gender identity? These clubs sometimes are called gay/straight alliances.	377 (76.8%)
Safe spaces	Does your school identify “safe spaces” (e.g., a counselor’s office, designated classroom, or student organization) where LGBTQ youth can receive support from administrators, teachers, or other school staff?	440 (89.6%)
Prohibit harassment	Does your school prohibit harassment based on a student’s perceived or actual sexual orientation or gender identity?	464 (94.5%)
Professional development	Does your school encourage staff to attend professional development on safe and supportive school environments for all students, regardless of sexual orientation or gender identity?	422 (85.9%)
Health services	Does your school facilitate access to providers not on school property who have experience in providing health services, including HIV/STD testing and counseling, to LGBTQ youth?	410 (83.5%)
Social/psych services	Does your school facilitate access to providers not on school property who have experience in providing social and psychological services to LGBTQ youth?	414 (84.3%)
LGBTQ curricula	Does your school provide curricula or supplementary materials that include HIV, STD, or pregnancy prevention information that is relevant to LGBTQ youth (e.g., curricula or materials that use inclusive language or terminology)?	376 (76.6%)
Sum of school policies and practices	Combined number of “yes” responses to LGBTQ-supportive school health policies and practices items	n/a

Source: 2014, 2016 School Health Profiles survey.<sup>21,22</sup>

HIV, human immunodeficiency virus; LGBTQ, lesbian, gay, bisexual, transgender, and questioning; n/a, not applicable; Psych, psychological; STD, sexually transmitted diseases.

questions on gender identity, and therefore, we were unable to identify transgender students in our sample.

Seven Profiles items assessed LGBTQ-supportive school policies and practices: (1) having a GSA or similar club; (2) identifying safe spaces; (3) prohibiting harassment based on sexual orientation or gender identity; (4) encouraging staff to attend professional development; (5) facilitating access to out-of-school health service providers; (6) facilitating access to out-of-school social and psychological service providers; and (7) providing LGBTQ-relevant curricula or supplementary materials (Table 1). All items were dichotomous, with principals responding to the first six items and lead health education teachers answering the last one. We also computed the sum of school policies and practices, indicat-

ing the number of LGBTQ-supportive school policies and practices available for each student. Scores ranged from 0 to 7, with higher scores indicating potential exposure to more school policies and practices.

The following five YRBS items assessed sexual health outcomes: (1) ever had sexual intercourse; (2) had four or more lifetime sexual partners; (3) were currently sexually active; (4) used a condom during last sexual intercourse; and (5) were ever tested for HIV (Table 2). Responses to questions on ever having sexual intercourse, condom use, and HIV testing were dichotomous; we further dichotomized the other two items to allow for comparisons between them. Sexual intercourse was not defined for survey participants.

TABLE 2. STUDENT SEXUAL HEALTH OUTCOMES—2015 AND 2017 YOUTH RISK BEHAVIOR SURVEY

<i>Outcome</i>	<i>Youth risk behavior survey question</i>	<i>Analytic coding</i>
Ever had sex	Have you ever had sexual intercourse?	0 = No; 1 = Yes
Had ≥4 lifetime sexual partners	During your life, with how many people have you had sexual intercourse?	0 = ≤3 people 1 = ≥4 people
Currently sexually active	During the past 3 months, with how many people did you have sexual intercourse?	0 = None 1 = ≥1 people
Used a condom during last sexual intercourse <sup>a</sup>	The last time you had sexual intercourse, did you or your partner use a condom?	0 = No; 1 = Yes
Ever tested for HIV	Have you ever been tested for HIV, the virus that causes AIDS? (Do not count tests done if you donated blood.)	0 = No; 1 = Yes

Source: 2015, 2017 Youth Risk Behavior Survey.<sup>23,24</sup>

<sup>a</sup>Asked only of male students who were currently sexually active and identified as gay, bisexual, or heterosexual.

The question on condom use asked about the last time the respondent had sexual intercourse. Since we were unable to determine the sex of the respondent's last sexual partner(s), we only examined responses for this question from sexually active male youth who identified as gay, bisexual, or heterosexual. For HIV testing, we conducted analyses separately for all youth and for sexually active youth only but found no significant differences between the two sets of analyses.

YRBS items assessed student-level covariates: (1) sex, dichotomized as "female" or "male" (reference group); (2) grade, including 9th (reference group), 10th, 11th, and 12th; (3) race/ethnicity, including non-Hispanic White (reference group), Black or African American, Hispanic or Latino of any race, and other; and (4) school priority, dichotomized as students in "priority" schools and students in "non-priority" schools (reference group).

The last covariate referred to the potential confounding effect of the DASH school health program, which included but was not limited to implementing LGBTQ-supportive school policies and practices. The program focused on "priority" schools or schools with higher rates of STIs, unwanted pregnancies, or sexual risk behaviors among students. "Non-priority" schools referred to schools in the same districts that were not the focus of program efforts but also collected Profiles and YRBS data and had the option to implement the same or similar policies and practices. The study compared schools implementing the LGBTQ-supportive policies and practices with schools that have not done so, regardless of whether the DASH program prioritized these schools or not.

#### Data analysis

Using SAS version 9.4 (SAS Institute Inc., Cary, NC), we conducted bivariate analyses with chi-square tests to analyze sexual health outcome differences between LGB and heterosexual students. Next, we used hierarchical linear modeling to examine the associations between LGBTQ-supportive school policies and practices and sexual health outcomes while accounting for the nesting of students within schools and controlling for sex, grade, race/ethnicity, and school priority.<sup>29,30</sup> Odds ratios (ORs) and corresponding confidence intervals (CIs) were calculated to compare sexual health outcomes between students in schools implementing the LGBTQ-supportive policies and practices and students in schools without them.

We conducted the analyses separately for LGB and heterosexual students. We chose this approach rather than conducting cross-level interactions because the school-level variance for several outcomes was too small, with several CIs crossing zero. Thus, cross-level interactions were not appropriate statistically in this case.<sup>31</sup> We applied the Holm-Bonferroni correction with an initial significance threshold of  $\alpha < 0.05$  within each set of outcomes to correct for multiple comparisons.<sup>32</sup> Since missing data points appeared to be a random subset of the data and their removal did not result in a significant loss of efficiency in parameter estimates, we assessed data using complete case analysis and the missing data were not imputed.<sup>33,34</sup>

#### Results

The study sample included 8347 (11.0%) LGB and 67,291 (89.0%) heterosexual students. Table 3 includes participant

TABLE 3. DEMOGRAPHICS OF STUDENT PARTICIPANTS—2015 AND 2017 YOUTH RISK BEHAVIOR SURVEY

	LGB (n = 8347)		Heterosexual (n = 67,291)		Combined (n = 75,638)	
	n	%	n	%	n	%
Sex						
Female	6113	74.0	31,808	47.5	37,921	50.4
Male	2145	26.0	35,208	52.5	37,353	49.6
Race/Ethnicity						
White	1220	14.6	9221	13.7	10,441	13.8
African American	2961	35.5	21,285	31.6	24,246	32.1
Hispanic/Latino	3017	36.1	26,367	39.2	29,384	38.9
Other	1149	13.8	10,418	15.5	11,567	15.3
Grade						
9th	2134	25.8	17,773	26.6	19,907	26.5
10th	2193	26.5	17,712	26.5	19,905	26.5
11th	2066	25.0	15,899	23.8	17,965	23.9
12th	1873	22.7	15,414	23.1	17,287	23.1
School						
Priority	4307	51.6	33,621	50.0	37,928	50.1
Nonpriority	4040	48.4	33,670	50.0	37,720	49.9
Year						
2015	3950	47.3	34,159	50.8	38,109	50.4
2017	4397	52.7	33,132	49.2	37,529	49.6

Totals for demographic items may not add up to overall total numbers due to some participants choosing to omit questions.

demographics, such as their sex, race/ethnicity, and school grade. The mean for the sum of LGBTQ-supportive school policies and practices was 5.73, with a standard deviation of 1.72. LGB students reported significantly higher rates of sexual risk behaviors than their heterosexual peers, while sexually active gay and bisexual male students were significantly less likely to use a condom during last sexual intercourse than their heterosexual peers (Table 4).

For LGB students (Tables 5 and 6), having a GSA or similar club (adjusted OR [aOR]: 0.81, 95% CI: 0.70–0.93) and prohibiting harassment (aOR: 0.44, 95% CI: 0.26–0.73) were significantly associated with lower odds of ever having sex, while facilitating access to out-of-school health service providers was significantly associated with lower odds of having four or more lifetime sexual partners (aOR: 0.72, 95% CI: 0.58–0.88). Having a GSA or similar club was significantly associated with lower odds of ever being tested for HIV (aOR: 0.74, 95% CI: 0.64–0.85), the opposite of the expected association. Other LGBTQ-supportive school policies and practices were not significantly related to any sexual health outcomes for LGB students. Having a greater number of LGBTQ-supportive school policies and practices was significantly related to lower odds of ever having sex (aOR: 0.95, 95% CI: 0.92–0.98) but not to any other outcomes.

For heterosexual students (Tables 7 and 8), all LGBTQ-supportive school policies and practices, aside from identifying safe spaces and prohibiting harassment, were significantly associated with lower odds of ever having sex, having four or more lifetime sexual partners, and being currently sexually active. Having a GSA or similar club, prohibiting harassment, and encouraging staff to attend professional development

TABLE 4. CHARACTERISTICS AND BIVARIATE ANALYSIS OF SEXUAL HEALTH OUTCOMES OF LESBIAN, GAY, BISEXUAL, AND HETEROSEXUAL STUDENTS

	<i>LGB</i>		<i>Heterosexual</i>		<i>Combined</i>		$\chi^2$	p
	n	%	n	%	n	%		
Ever had sex <sup>a</sup>							<b>394.05</b>	<b>&lt;0.0001</b>
Yes	3115	48.6	19,400	35.9	22,515	37.3		
No	3295	51.5	34,614	64.1	37,909	62.7		
Had $\geq 4$ lifetime sexual partners <sup>a</sup>							<b>49.41</b>	<b>&lt;0.0001</b>
Yes	797	13.0	5073	10.1	5870	10.4		
No	5321	87.0	45,070	89.9	50,391	89.6		
Currently sexually active <sup>a</sup>							<b>207.12</b>	<b>&lt;0.0001</b>
Yes	2097	33.3	12,985	24.9	15,082	25.8		
No	4206	66.7	39,215	75.1	43,421	74.2		
Used a condom during last sex <sup>b</sup>							<b>11.18</b>	<b>&lt;0.001</b>
Yes	209	58.5	4478	67.1	4687	66.7		
No	148	41.5	2195	32.9	2343	33.3		
Ever tested for HIV <sup>a</sup>							<b>274.90</b>	<b>&lt;0.0001</b>
Yes	2092	28.0	11,468	19.8	13,560	20.7		
No	5379	72.0	46,607	80.3	51,986	79.3		
Ever tested for HIV <sup>c</sup>							<b>72.67</b>	<b>&lt;0.0001</b>
Yes	1161	39.9	5682	31.9	6843	33.1		
No	1745	60.1	12,114	68.1	13,859	67.0		

Results in bold are significant at  $p < 0.05$ .

All analyses controlled for sex, grade, race/ethnicity, and school priority.

<sup>a</sup>Of all youth.

<sup>b</sup>Of sexually active male youth only.

<sup>c</sup>Of sexually active youth only.

were also significantly associated with lower odds of ever being tested for HIV. None of the examined policies and practices was significantly related to using a condom during last sexual intercourse for sexually active heterosexual men. Having a greater number of LGBTQ-supportive school policies and practices was significantly associated with lower odds of ever having sex, having four or more lifetime sexual partners, being currently sexually active, and ever being tested for HIV.

## Discussion

Overall, most LGBTQ-supportive school policies and practices were associated with lower odds of adverse sexual health outcomes for LGB and heterosexual students, in line with past research. Previous studies suggest that such policies and practices provide sexual and gender minority youth with access to health resources and support, promote safer school environments, and improve their relations with peers, which in turn reduce their identity-related stressors and susceptibility to adverse sexual health outcomes.<sup>12,13,16,17</sup>

Nevertheless, several LGBTQ-supportive school policies and practices, such as identifying safe spaces, were not significantly related to any sexual health outcomes. Since the YRBS does not assess the students' use of school policies and practices, we cannot determine whether students were aware of and accessed them. Furthermore, the hypothesized mechanisms of action between LGBTQ-supportive school policies and practices and sexual health outcomes may not be applicable for some of the examined associations, such as between identifying safe spaces and being tested for HIV testing.

Notably, we found that LGBTQ-supportive school policies and practices were significantly associated with more

sexual health outcomes for heterosexual students than for their LGB peers. Past research offers some potential rationale for these findings. The benefits of LGBTQ-supportive school policies and practices are not limited to LGB students, but rather promote a positive school climate, improve interpersonal relationships, and provide health resources for all students.<sup>13,17,19</sup> Heterosexual students in general experience fewer stressors, while LGB youth may continue to face identity-related stressors outside of school.<sup>5-7</sup> Thus, the positive school climate may bring more pronounced health benefits for heterosexual students. Further research needs to explore what mechanisms may be responsible for the observed differences in associations between LGB and heterosexual students. Notably, the analysis of overall health benefits of these policies and practices should also include other health outcomes, such as mental health or suicide-related behaviors, which we explored in a subsequent study.<sup>21</sup>

Finally, the study examined the associations between the sum of LGBTQ-supportive school policies and practices and sexual health outcomes. Having a greater number of LGBTQ-supportive school policies and practices was significantly associated with lower odds of ever having sex for LGB students and of multiple sexual health outcomes for heterosexual students. Given that most secondary schools implement multiple LGBTQ-supportive policies and practices simultaneously, this approach is of particular significance for their evaluation and improvement.<sup>35</sup>

The study used a grouped LGB variable to meet the minimum sample size requirements for logistic regressions.<sup>27</sup> A grouped LGB variable, however, is likely to mask differential associations within this group. For instance, bisexual

TABLE 5. REGRESSION MODELING OF LESBIAN, GAY, BISEXUAL, TRANSGENDER, AND QUESTIONING-SUPPORTIVE SCHOOL POLICIES AND PRACTICES AMONG LESBIAN, GAY, AND BISEXUAL STUDENTS

Outcomes	Policies and practices							Sum of policies/ practices
	Gay/straight alliances	Safe spaces	Prohibit harassment	Professional development	Health services	Social/psych services	LGBTQ curricula	
	<i>aOR (95% CI)</i>							
Ever had sex <sup>a</sup>	<b>0.81 (0.70-0.93)</b>	0.85 (0.67-1.07)	<b>0.44 (0.26-0.73)</b>	0.85 (0.71-1.02)	0.87 (0.74-1.01)	0.86 (0.74-1.00)	0.86* (0.75-0.98)	<b>0.95 (0.92-0.98)</b>
Had ≥4 lifetime sexual partners <sup>a</sup>	0.87 (0.70-1.07)	0.92 (0.66-1.29)	0.64 (0.34-1.21)	0.93 (0.72-1.19)	<b>0.72 (0.58-0.88)</b>	0.85 (0.69-1.04)	0.86 (0.71-1.03)	0.94* (0.90-0.99)
Currently sexually active <sup>a</sup>	0.84* (0.73-0.98)	1.03 (0.80-1.31)	0.61* (0.37-0.99)	0.94 (0.78-1.13)	0.92 (0.78-1.07)	0.95 (0.82-1.11)	0.90 (0.78-1.02)	0.97 (0.93-1.00)
Used a condom during last sex <sup>b</sup>	0.84 (0.44-1.58)	1.19 (0.42-3.34)	2.44 (0.37-16.17)	1.12 (0.50-2.52)	0.58 (0.28-1.18)	0.71* (0.50-0.94)	1.55 (0.91-2.65)	1.01 (0.87-1.16)
Ever tested for HIV <sup>a</sup>	<b>0.74 (0.64-0.85)</b>	0.86 (0.68-1.08)	0.75 (0.46-1.22)	0.94 (0.78-1.13)	0.90 (0.77-1.06)	0.82* (0.71-0.95)	1.04 (0.91-1.19)	0.96* (0.93-0.99)
Ever tested for HIV <sup>c</sup>	<b>0.98 (0.96-0.99)</b>	0.85 (0.60-1.19)	0.58 (0.31-1.11)	0.91 (0.70-1.19)	0.92 (0.73-1.16)	0.85 (0.68-1.06)	1.09 (0.89-1.32)	0.96 (0.92-1.01)

Results in bold are significant at  $p < 0.05$ .

All analyses controlled for sex, grade, race/ethnicity, and school priority status.

<sup>a</sup>Of all youth.

<sup>b</sup>Of sexually active male youth only.

<sup>c</sup>Of sexually active youth only.

\*Not significant at  $p < 0.05$  following the Holm-Bonferroni correction.<sup>30</sup>

aOR, adjusted odds ratio; CI, confidence interval.

TABLE 6. FIXED EFFECTS FOR REGRESSION MODELS OF LESBIAN, GAY, BISEXUAL, TRANSGENDER, AND QUESTIONING-SUPPORTIVE SCHOOL POLICIES AND PRACTICES AMONG LESBIAN, GAY, AND BISEXUAL STUDENTS

Outcomes	Policies and practices							Sum of policies/ practices
	Gay/straight alliances	Safe spaces	Prohibit harassment	Professional development	Health services	Social/psych services	LGBTQ curricula	
	<i>Estimate (SE)</i>							
Ever had sex <sup>a</sup>	<b>-0.214 (0.074)</b>	-0.166 (0.120)	<b>-0.830 (0.262)</b>	-0.163 (0.091)	-0.144 (0.079)	-0.149 (0.075)	-0.152 (0.067)	<b>-0.054 (0.017)</b>
Had ≥4 lifetime sexual partners <sup>a</sup>	-0.144 (0.106)	-0.080 (0.169)	-0.448 (0.325)	-0.076 (0.129)	<b>-0.333 (0.107)</b>	-0.166 (0.106)	-0.154 (0.095)	-0.058 (0.023)
Currently sexually active <sup>a</sup>	-0.169 (0.075)	0.026 (0.125)	-0.498 (0.248)	-0.065 (0.095)	-0.088 (0.081)	-0.052 (0.078)	-0.111 (0.069)	-0.036 (0.017)
Used a condom during last sex <sup>b</sup>	0.097 (0.122)	0.246 (0.216)	0.087 (0.382)	0.101 (0.160)	0.093 (0.133)	0.063 (0.131)	0.118 (0.112)	0.051 (0.029)
Ever tested for HIV <sup>a</sup>	<b>-0.307 (0.072)</b>	-0.156 (0.117)	-0.286 (0.246)	-0.060 (0.093)	-0.102 (0.081)	-0.196 (0.076)	0.037 (0.068)	-0.040 (0.017)
Ever tested for HIV <sup>c</sup>	<b>-0.402 (0.108)</b>	-0.166 (0.173)	-0.538 (0.327)	-0.093 (0.135)	-0.082 (0.119)	-0.161 (0.112)	0.082 (0.099)	-0.039 (0.025)

Results in bold are significant at  $p < 0.05$  following the Holm-Bonferroni correction.<sup>30</sup>

All analyses controlled for sex, grade, race/ethnicity, and school priority status.

<sup>a</sup>Of all youth.

<sup>b</sup>Of sexually active male youth only.

<sup>c</sup>Of sexually active youth only.

SE, standard error.

TABLE 7. REGRESSION MODELING OF LESBIAN, GAY, BISEXUAL, TRANSGENDER, AND QUESTIONING-SUPPORTIVE SCHOOL POLICIES AND PRACTICES AMONG HETEROSEXUAL STUDENTS

Outcomes	Policies and practices							Sum of policies/ practices
	Gay/straight alliances	Safe spaces	Prohibit harassment	Professional development	Health services	Social/psych services	LGBTQ curricula	
	<i>aOR (95% CI)</i>							
Ever had sex <sup>a</sup>	<b>0.76 (0.72-0.80)</b>	0.95 (0.87-1.04)	0.87 (0.71-1.06)	<b>0.87 (0.82-0.93)</b>	<b>0.92 (0.87-0.97)</b>	<b>0.87 (0.82-0.92)</b>	<b>0.89 (0.85-0.93)</b>	<b>0.96 (0.95-0.97)</b>
Had ≥4 lifetime sexual partners <sup>a</sup>	<b>0.76 (0.70-0.83)</b>	0.85* (0.75-0.96)	0.96 (0.72-1.27)	<b>0.88 (0.80-0.97)</b>	<b>0.85 (0.78-0.92)</b>	<b>0.82 (0.76-0.90)</b>	<b>0.88 (0.82-0.95)</b>	<b>0.95 (0.93-0.96)</b>
Currently sexually active <sup>a</sup>	<b>0.81 (0.76-0.86)</b>	1.00 (0.91-1.10)	0.90 (0.73-1.11)	<b>0.90 (0.84-0.97)</b>	<b>0.90 (0.85-0.95)</b>	<b>0.88 (0.83-0.93)</b>	<b>0.89 (0.84-0.93)</b>	<b>0.97 (0.95-0.98)</b>
Used a condom during last sex <sup>b</sup>	0.96 (0.84-1.11)	0.94 (0.97-1.52)	1.45 (0.92-2.28)	1.08 (0.93-1.27)	1.09 (0.95-1.26)	1.08 (0.94-1.24)	1.01 (0.89-1.14)	1.00 (0.97-1.03)
Ever tested for HIV <sup>a</sup>	<b>0.80 (0.76-0.85)</b>	0.93 (0.85-1.02)	<b>0.74 (0.61-0.90)</b>	<b>0.88 (0.81-0.94)</b>	0.96 (0.90-1.02)	0.92* (0.87-0.98)	1.00 (0.95-1.06)	<b>0.97 (0.96-0.99)</b>
Ever tested for HIV <sup>c</sup>	<b>0.83 (0.76-0.91)</b>	0.86 (0.75-1.00)	<b>0.62 (0.46-0.83)</b>	<b>0.88 (0.79-0.98)</b>	0.98 (0.89-1.09)	0.93 (0.85-1.02)	1.03 (0.95-1.12)	<b>0.98 (0.96-1.00)</b>

Results in bold are significant at  $p < 0.05$ .

All analyses controlled for sex, grade, race/ethnicity, and school priority status.

<sup>a</sup>Of all youth.

<sup>b</sup>Of sexually active male youth only.

<sup>c</sup>Of sexually active youth only.

\*Not significant at  $p < 0.05$  following the Holm-Bonferroni correction.<sup>30</sup>

TABLE 8. FIXED EFFECTS FOR REGRESSION MODELS OF LESBIAN, GAY, BISEXUAL, TRANSGENDER, AND QUESTIONING-SUPPORTIVE SCHOOL POLICIES AND PRACTICES AMONG HETEROSEXUAL STUDENTS

Outcomes	Policies and practices							Sum of policies/ practices
	Gay/straight alliances	Safe spaces	Prohibit harassment	Professional development	Health services	Social/psych services	LGBTQ curricula	
	<i>Estimate (SE)</i>							
Ever had sex <sup>a</sup>	<b>-0.276 (0.028)</b>	-0.047 (0.045)	-0.142 (0.010)	<b>-0.135 (0.032)</b>	<b>-0.086 (0.029)</b>	<b>-0.139 (0.028)</b>	<b>-0.121 (0.024)</b>	<b>-0.045 (0.006)</b>
Had ≥4 lifetime sexual partners <sup>a</sup>	<b>-0.270 (0.041)</b>	-0.163 (0.064)	-0.045 (0.144)	<b>-0.130 (0.048)</b>	<b>-0.167 (0.044)</b>	<b>-0.193 (0.042)</b>	<b>-0.128 (0.037)</b>	<b>-0.056 (0.009)</b>
Currently sexually active <sup>a</sup>	<b>-0.211 (0.030)</b>	0.003 (0.049)	-0.110 (0.108)	<b>-0.104 (0.035)</b>	<b>-0.107 (0.031)</b>	<b>-0.132 (0.030)</b>	<b>-0.123 (0.026)</b>	<b>-0.034 (0.006)</b>
Used a condom during last sex <sup>b</sup>	0.086 (0.052)	0.250 (0.085)	0.398 (0.181)	0.029 (0.060)	0.051 (0.054)	0.076 (0.052)	-0.039 (0.045)	0.025 (0.011)
Ever tested for HIV <sup>a</sup>	<b>-0.185 (0.046)</b>	-0.071 (0.049)	<b>-0.299 (0.101)</b>	<b>-0.134 (0.036)</b>	-0.044 (0.033)	-0.079 (0.031)	0.003 (0.027)	<b>-0.028 (0.007)</b>
Ever tested for HIV <sup>c</sup>	<b>-0.185 (0.046)</b>	-0.146 (0.076)	<b>-0.485 (0.155)</b>	<b>-0.124 (0.055)</b>	-0.018 (0.051)	-0.073 (0.048)	0.032 (0.042)	<b>-0.021 (0.011)</b>

Results in bold are significant at  $p < 0.05$  following the Holm-Bonferroni correction.<sup>30</sup>

All analyses controlled for sex, grade, race/ethnicity, and school priority status.

<sup>a</sup>Of all youth.

<sup>b</sup>Of sexually active male youth only.

<sup>c</sup>Of sexually active youth only.

students report higher levels of sexual risk behaviors than their gay or lesbian peers and encounter more barriers to appropriate sexual health services due to several identity-related factors, such as social expectations and assumptions about their sexual orientation and health needs.<sup>7,8,10</sup>

Furthermore, we found significant demographic and health outcome differences between LGB and heterosexual student samples. LGB students were disproportionately female and were significantly more likely to report poor sexual health outcomes compared to their heterosexual peers. While such findings align with past research on disparities in sexual health outcomes between LGB and heterosexual students,<sup>1,2</sup> the notable differences between the two groups should be accounted for while drawing any conclusions based on this study.

Finally, the study explored the hypothesized associations separately for LGB and heterosexual students, rather than examining cross-level interactions between the students' sexual identity and school-level policies and practices, due to the school-level variance limitations. However, future studies should explore such cross-level interactions to better determine how the strengths of the observed associations vary based on sexual identity status.

### Limitations

Study findings are subject to several limitations. Since we only examined the associations between the variables based on cross-sectional data, we cannot draw inferences about the causality of the observed findings. Furthermore, YRBS and Profiles responses were self-reported and might be subject to response bias. Since our sample was not nationally representative, our findings may not be generalizable to the larger population. Furthermore, the need to merge YRBS and Profiles datasets across multiple collection cycles resulted in a significant (51%–61%) reduction in sample size compared to the original datasets. Both surveys also did not clearly define some of its terms, such as “sexual intercourse.” Thus, our participants could have interpreted these questions in varying ways.

In addition, ceiling effects could potentially explain the lack of significant findings for some associations, given the relatively high proportion of students attending schools with LGBTQ-supportive school policies and practices, such as prohibiting harassment (94.5%). We lacked additional information regarding school contexts and types of sexual health education provided. Finally, we used a sexual identity question to categorize students as LGB or heterosexual. Sexual identity, however, does not necessarily align with sexual behavior or actual sexual orientation.<sup>36</sup> Thus, we may have unintentionally excluded students who have experienced same-sex sexual activities or attraction but who identify as heterosexual or are not sure of their sexual identity. We also did not examine other sexual and gender minority groups, such as transgender and questioning youth.

### Conclusion

This study highlights the continued need for multifaceted LGBTQ-supportive school policies and practices. Our findings indicate that such policies and practices promote better sexual health outcomes among both LGB and heterosexual youth. However, more research is needed to explore these as-

sociations in more detail. When refining their policies and practices, schools should consider the varying degrees to which they impact LGB or heterosexual students.

### Acknowledgments

The authors thank Elyse Phillips and Zachary Timpe for their contributions to the collection and management of the original datasets used in this study, as well as to Nicole Lid-don and Patricia Dittus for their feedback and revisions.

### Authors' Contributions

W.K. contributed to the data analysis and interpretation for the study, led the writing of the article, and responded to the other authors' edits and comments. A.C.C. contributed to the data analysis and interpretation for the study, the writing of portions of the article, and revised it and provided edits and comments during the writing stage. J.L. contributed to the data analysis and interpretation for the study, the writing of portions of the article, and revised it and provided edits and comments during the writing stage. L.R. contributed to the data analysis and interpretation of the study and revised and approved the article before submission. All coauthors reviewed and approved the article before submission.

### Disclaimer

The findings and conclusions in this article are those of the author(s) and do not necessarily represent the Centers for Disease Control and Prevention.

### Author Disclosure Statement

No competing financial interests exist.

### Funding Information

No funding was received for this article.

### References

1. Kann L, Olsen EOM, McManus T, et al.: Sexual identity, sex of sexual contacts, and health-related behaviors among students in grades 9–12—United States and selected sites, 2015. *MMWR Morb Mortal Wkly Rep* 2016;65:1–202.
2. Division of Adolescent and School Health: *Youth Risk Behavior Survey Data Summary & Trends Report 2007–2017*. Atlanta, GA: Centers for Disease Control and Prevention, 2020.
3. Everett BG, Schnarrs PW, Rosario M, et al.: Sexual orientation disparities in sexually transmitted infection risk behaviors and risk determinants among sexually active adolescent males: Results from a school-based sample. *Am J Public Health* 2014;104:1107–1112.
4. Tornello SL, Riskind RG, Patterson CJ: Sexual orientation and sexual and reproductive health among adolescent young women in the United States. *J Adolesc Health* 2014; 54:160–168.
5. Meyer IH, Frost DM: Minority stress and the health of sexual minorities. In: *Handbook of Psychology and Sexual Orientation*. Edited by Patterson CJ, D'Augelli AR. Oxford, United Kingdom: Oxford University Press, 2013, pp 252–266.
6. Meyer IH: Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Bull* 2003;129:674.



7. Hatzenbuehler ML: How does sexual minority stigma “get under the skin”? A psychological mediation framework. *Psychol Bull* 2009;135:707.
8. Higgins JA, Carpenter E, Everett BG, et al.: Sexual minority women and contraceptive use: Complex pathways between sexual orientation and health outcomes. *Am J Public Health* 2019;109:1680–1686.
9. Conway DP, Holt M, Couldwell DL, et al.: Barriers to HIV testing and characteristics associated with never testing among gay and bisexual men attending sexual health clinics in Sydney. *J Int AIDS Soc* 2015;18:20221.
10. Arbeit MR, Fisher CB, Macapagal K, Mustanski B: Bisexual invisibility and the sexual health needs of adolescent girls. *LGBT Health* 2016;3:342–349.
11. Feinstein BA, Dodge B: Meeting the sexual health needs of bisexual men in the age of biomedical HIV prevention: Gaps and priorities. *Arch Sex Behav* 2020;49:217–232.
12. Day JK, Ioverno S, Russell ST: Safe and supportive schools for LGBT youth: Addressing educational inequities through inclusive policies and practices. *J Sch Psychol* 2019;74:29–43.
13. Russell ST, Bishop MD, Saba VC, et al.: Promoting school safety for LGBTQ and all students. *Policy Insights Behav Brain Sci* 2021;8:160–166.
14. Russell ST, Day JK, Ioverno S, Toomey RB: Are school policies focused on sexual orientation and gender identity associated with less bullying? Teachers’ perspectives. *J Sch Psychol* 2016;54:29–38.
15. Villalobos MC, Marshall SK, Saewyc E: Longitudinal effects of LGBTQ-focused school-based interventions on adolescent sexual health behaviors among Canadian students. *J Adolesc Health* 2020;66:S19–S20.
16. Lessard LM, Puhl RM, Watson RJ: Gay–straight alliances: A mechanism of health risk reduction among lesbian, gay, bisexual, transgender, and questioning adolescents. *Am J Prev Med* 2020;59:196–203.
17. Poteat VP, Sinclair KO, DiGiovanni CD, et al.: Gay–straight alliances are associated with student health: A multischool comparison of LGBTQ and heterosexual youth. *J Res Adolesc* 2013;23:319–330.
18. Griffin P, Lee C, Waugh J, Beyer C: Describing roles that gay–straight alliances play in schools: From individual support to school change. *J LGBT Youth* 2004;1:7–22.
19. Philbin MM, Wang X, Feaster DJ, et al.: LGB-affirming school climates and sexual health outcomes among US high school students 2015–2017: Differences by sex and sexual identity. *J Adolesc Health* 2021;68:1121–1128.
20. Ioverno S, Bishop MD, Russell ST: Does a decade of school administrator support for educator training on students’ sexual and gender identity make a difference for students’ victimization and perceptions of school climate? *Prev Sci* 2021;23:108–118.
21. Kaczkowski W, Li J, Cooper AC, Robin L: Examining the relationship between LGBTQ-supportive school health policies and practices and psychosocial health outcomes of lesbian, gay, bisexual, and heterosexual students. *LGBT Health* 2022;9:43–53.
22. Demissie Z, Brener ND, McManus T, et al.: *School Health Profiles 2014: Characteristics of Health Programs Among Secondary Schools*. Atlanta, GA: Centers for Disease Control and Prevention, 2015.
23. Brener ND, Demissie Z, McManus T, et al.: *School Health Profiles 2016: Characteristics of Health Programs Among Secondary Schools*. Atlanta, GA: Centers for Disease Control and Prevention, 2017.
24. Kann L, McManus T, Harris WA, et al.: Youth Risk Behavior Surveillance—United States, 2015. *MMWR Surveill Summ* 2016;65:1–174.
25. Kann L, McManus T, Harris WA, et al.: Youth Risk Behavior Surveillance—United States, 2017. *MMWR Surveill Summ* 2018;67:1–114.
26. Underwood JM, Brener N, Thornton J, et al.: Overview and methods for the Youth Risk Behavior Surveillance System—United States, 2019. *MMWR Suppl* 2020;69:1–10.
27. Peduzzi P, Concato J, Kemper E, et al.: A simulation study of the number of events per variable in logistic regression analysis. *J Clin Epidemiol* 1996;49:1373–1379.
28. Division of Adolescent and School Health: *How to Analyze YRBS Sexual Minority Data*. Atlanta, GA: Centers for Disease Control and Prevention, 2018.
29. Ene M, Leighton E, Blue G, Bell B: Multilevel models for categorical data using SAS® PROC GLIMMIX: The basics. Paper 3430-2015. 2015. Available at <https://support.sas.com/resources/papers/proceedings15/3430-2015.pdf> Accessed October 20, 2021.
30. Li J, Alterman T, Deddens JA: Analysis of large hierarchical data with multilevel logistic modeling using PROC GLIMMIX. Paper 151-31. 2006. Available at <https://support.sas.com/resources/papers/proceedings/proceedings/sugi31/151-31.pdf> Accessed October 20, 2021.
31. Wang R, Ware JH: Detecting moderator effects using subgroup analyses. *Prev Sci* 2013;14:111–120.
32. Abdi H: Holm’s sequential Bonferroni procedure. In: *Encyclopedia of Research Design*. Edited by Salkind N. Thousand Oaks, CA: Sage Publishing, 2010, pp 1–8.
33. Pigott TD: A review of methods for missing data. *Educ Res Eval* 2001;7:353–383.
34. Jamshidian M, Mata M: Advances in analysis of mean and covariance structure when data are incomplete. In: *Handbook of Latent Variable and Related Models*. Edited by Lee SY. Amsterdam, Netherlands: Elsevier, 2007, pp 21–44.
35. Division of Adolescent and School Health: *Program 1308 Guidance: Supporting State and Local Education Agencies to Reduce Adolescent Sexual Risk Behaviors and Adverse Health Outcomes Associated with HIV, Other STD, and Teen Pregnancy*. Atlanta, GA: Centers for Disease Control and Prevention, 2014.
36. Rosario M, Schrimshaw EW, Hunter J, et al.: Sexual identity development among lesbian, gay, and bisexual youths: Consistency and change over time. *J Sex Res* 2006;43:46–58.

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