

Associations Between School Programs Related to Inclusivity and Interpersonal Violence Victimization among
United States High School Students

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Abstract

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Introduction: Adolescent interpersonal violence victimization (e.g., bullying, teen dating violence, sexual violence) is prevalent and can lead to adverse physical and mental health outcomes, short- and long-term, if unaddressed. Schools can work to prevent and address adolescent interpersonal violence through inclusive school climates, programs, and policies. This research aims to examine the associations for school programs related to inclusivity with different forms of adolescent interpersonal violence victimization.

Methods: We used 2018 School Health Profiles and 2019 Youth Risk Behavior Survey data to investigate associations between state-level proportions of school programs related to inclusivity and adolescent self-reported interpersonal violence victimization using survey-weighted logistic regression.

Results: Having a 10% greater state-level proportion of high schools with a *health and safety program/activities coordinator* was associated with higher odds of forced sexual intercourse [aOR=1.15, 95% CI=1.02, 1.29] and physical teen dating violence [aOR=1.45, 95% CI=1.27, 1.65]. Having a 10% greater state-level proportion of high schools with *clubs that give students opportunities to learn about people different from them* was associated with lower odds of forced sexual intercourse [aOR=0.90, 95% CI=0.86, 0.96], physical teen dating violence [aOR=0.94, 95% CI=0.89, 1.00], and bullying experienced electronically [aOR=0.92, 95% CI=0.88, 0.96]. Having a 10% greater state-level proportion of high schools with *gay-straight alliance clubs* was associated with lower odds of forced sexual intercourse [aOR=0.91, 95% CI=0.89, 0.94] and bullying experienced at school [aOR=0.97, 95% CI=0.95, 0.99].

Conclusion: The results suggest mixed associations between school programs related to inclusivity and different forms of adolescent self-reported interpersonal violence victimization. Further research should be conducted to understand these relationships, and to ensure the school programs are equitable and effective for students of all identities.

INTRODUCTION

Interpersonal violence victimization includes sexual violence (SV), sexual teen dating violence (TDV), physical TDV, and bullying.¹ In the United States (U.S.) in 2021, 11.0% of high school students reported past-year SV victimization, 9.7% reported past-year sexual TDV victimization, and 8.5% reported past-year physical TDV victimization.¹ Additionally, 15.0% and 15.9% of high school students have experienced past-year bullying on school property and electronic bullying, respectively.¹ Adolescent interpersonal violence victimization is a critical public health issue that can lead to adverse short- and long-term health outcomes (i.e., substance use, worse mental health, victimization in adulthood, death).^{2,3} Different forms of interpersonal violence victimization are highly connected and share common risk factors, and individuals often experience multiple forms of violence.^{3,4} Therefore, similar prevention approaches may be able to address multiple forms of interpersonal violence victimization.⁴⁻⁶

School climate can shape the way students interact with one another.⁷ Recent studies have examined the association between supportive school climates and health outcomes for high school students, using gay-straight alliance clubs (GSAs) and lesbian, gay, bisexual, transgender, and queer (LGBTQ+) inclusive sexual health education as examples of school programs that promote supportive school climates.⁸⁻¹⁰ GSAs are student-led organizations for LGBTQ+ students and allies to come together and build community in their school, ultimately creating a more inclusive and safe environment.¹¹ Though, studies examining GSAs in relation to interpersonal violence victimization outcomes for high school students have mixed findings.^{8,10} For example, in one study looking at data from local education agencies across the U.S., GSAs were not associated with interpersonal violence victimization outcomes for LGBTQ+ students, but were associated with lower odds for lifetime forced sexual intercourse victimization and

past-year physical TDV victimization for heterosexual students.¹⁰ In another study looking at schools across New Mexico, GSAs were associated with lower odds for lifetime forced sexual intercourse victimization and past-year TDV victimization for lesbian, gay, and bisexual students but no associations for students who identified as transgender.⁸ In addition, GSAs were associated with lower odds for lifetime forced sexual intercourse victimization and past-year SV victimization for heterosexual students.⁸

In addition to school programs, school policies can also shape school climate. Futures Without Violence has developed a model policy to help schools and districts create policies that address school safety and school climate.¹² This model policy suggests having a coordinator or liaison for violence prevention efforts can be helpful for implementing school-wide staff training, implementing investigations and response procedures for incidents of violence, among other responsibilities.¹² The presence of a health and safety program coordinator may ensure that procedures are being followed by high schools consistently to address interpersonal violence victimization. However, few studies have examined associations between the presence of a coordinator and interpersonal violence victimization outcomes.

The presence of a health and safety program coordinator, school clubs that gives students opportunities to learn about people different from them, and GSAs all have the potential to foster an inclusive school environment. The goal of this research is to investigate associations of these school programs related to inclusivity with interpersonal violence victimization for high school students. Results from this research may help inform future studies related to school programs and violence-related outcomes, which can further lead to evidence-based violence prevention recommendations for schools.

METHODS

Study design

This was a cross-sectional study using the 2018 School Health Profiles dataset and the 2019 Youth Risk Behavior Survey (YRBS) dataset, both collected by the Centers for Disease Control and Prevention (CDC).^{13,14} Both datasets are weighted to represent school health practices for public schools that serve grades 6 through 12 (School Health Profiles) and public high school students (YRBS) in their respective states. Since the School Health Profiles data includes data collected from schools that serve grades 6 through 12, we decided to conduct our primary analysis only using the representative data collected from schools that serve grades 9 through 12, since that is the population for the YRBS data. In addition, we used 2018 and 2019 datasets to avoid misclassification of the exposure (school programs) due to the coronavirus disease pandemic interrupting in-person learning environments. This research was determined to be exempt for review by the University of Washington Institutional Review Board.

Exposures

Exposure measurements included questions from the 2018 School Health Profiles dataset that captured school programs related to inclusivity (Table 1). The School Health Profiles is administered bi-annually to principals and lead health educators to capture school health policies and practices.¹³

Health and safety program/activities coordinator: principals were asked to indicate yes/no to the question, “Currently, does someone at your school oversee or coordinate school health and safety programs and activities?”

Clubs that give students opportunities to learn about people different from them:

principals were asked to indicate yes/no to the question, “Does your school have any clubs that give students opportunities to learn about people different from them, such as students with disabilities, homeless youth, or people from different cultures?”

GSAs: principals were asked to indicate yes/no to the question, “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.”

Using the principal questionnaire for each state that participated in the 2018 survey with available weighted data, we calculated representative state-level proportions of schools with these programs related to inclusivity for high schools only and then for middle and high school combined.

Outcomes

Outcome measurements included questions from the 2019 YRBS (Table 1). The YRBS is administered bi-annually to high school students to capture health behaviors and experiences, including experiences of interpersonal violence victimization.¹⁴

Forced sexual intercourse: students were asked, “Have you ever been physically forced to have sexual intercourse when you did not want to?”

SV: students were asked, “During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)”

Sexual TDV: students were asked, “During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want

to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)”

Physical TDV: students were asked, “During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon.)”

Bullying experienced at school: students were asked, “During the past 12 months, have you ever been bullied on school property?”

Bullying experienced electronically: students were asked, “During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)”

Responses were coded dichotomously (yes/no) to reflect any interpersonal violence victimization experienced versus no interpersonal violence victimization experienced for each question.

Covariates

State-level covariates were included to adjust for potential differences across states that could influence the proportion of school programs and a student’s experience with interpersonal violence victimization. Schools with more funding and resources may have increased capacity to implement additional programs and extra-curricular activities for students. In addition, socio-economic status is known to be associated with interpersonal violence victimization.¹⁵ Therefore, the adjusted model uses state-level median household income from the 2015 American Community Survey (ACS).¹⁶ Furthermore, states have different policies that may harm or protect LGBTQ+ individuals. States with policies that harm LGTBQ+ individuals may be less likely to have school programs that promote inclusivity, such as GSAs. Similarly, these same states may

have increased victimization rates, particularly for LGBTQ+ students. The State Policy Tallies, developed by the Movement Advancement Project, quantifies harmful and protective policies/laws in each state that impact the rights and programs that LGBTQ+ people have access to and assigns the state a point value ranging from -30.5 to +44.5, with harmful state policies/laws earning negative points and protective state policies/laws earning positive points to create an aggregated total for the state.¹⁷ Therefore, the adjusted model also uses 2015 State Policy Tallies.¹⁸ Both of these state-level covariates have been used in prior literature examining similar associations.⁹ The 2015 datasets were selected for ACS and the State Policy Tallies to ensure the state-level covariates preceded the exposures and outcomes measured in 2018 and 2019, respectively. Supplemental Table 1 summarizes the state-level covariates used in the analysis in addition to the state-level proportions that were calculated for high schools for the primary analysis.

Data analysis

We started with 119,118 students from the YRBS dataset that included states with corresponding state-level School Health Profiles data (full list of states included are shown in Supplemental Table 1). Students that did not answer at least one of the interpersonal violence victimization questions in the YRBS were excluded from the dataset analyzed. In total, 170 students were excluded from the analysis, which left a final analytic sample of 118,948 students. Out of the 118,948 students, 83,302 answered the question for lifetime forced sexual intercourse, 80,256 answered the question for past-year SV, 47,083 answered the question for past-year sexual TDV, 70,242 answered the question for past-year physical TDV, 98,450 answered the question for past-year bullying experienced at school, and 117,730 answered the question for past-year bullying experienced electronically.

Each record in the YRBS dataset was assigned the three calculated School Health Profiles proportions, median state-level household income, and the State Policy Tallies score, based on their state. For example, all Alabama YRBS records were assigned the three proportions calculated from the Alabama School Health Profiles dataset, the median household income for Alabama, and the State Policy Tallies score for Alabama. We examined associations between the state-level proportions of school programs related to inclusivity and a student's odds of experiencing violence victimization using survey-weighted logistic regression models. We subsequently adjusted for state-level covariates. We also explored sex, grade, race/ethnicity, and sexual identity as effect modifiers (e.g., do associations differ across ages and identities).

Sensitivity analyses were conducted to detect if associations changed when using (1) middle school and high school data for the state-level proportion calculations and (2) treating the high school state-level proportions as a categorical variable rather than a continuous variable. For the first sensitivity analysis, state-level proportions were re-calculated using all School Health Profiles data that included middle school through high school responses, rather than just high school responses, to increase the number of schools that were contributing to the state-level exposure calculations. For the second sensitivity analysis, the exposure variables (with high school data only) were each categorized by their respective quartiles, and then included in the logistic regression models as dummy variables. The state-level proportion of high schools with a *health and safety program/activities coordinator* was categorized into four groups: $\leq 87.58\%$ ($\leq 25^{\text{th}}$ percentile), $87.59\text{--}89.91\%$ ($> 25^{\text{th}}$ percentile and $\leq 50^{\text{th}}$ percentile), $89.92\text{--}92.70\%$ ($> 50^{\text{th}}$ percentile and $\leq 75^{\text{th}}$ percentile), and $> 92.70\%$ ($> 75^{\text{th}}$ percentile). Similarly, the four groups for the state-level proportion of high schools with *clubs that give opportunities for students to learn about people different from them* included $\leq 69.84\%$ ($\leq 25^{\text{th}}$ percentile), $69.85\text{--}75.67\%$ ($> 25^{\text{th}}$

percentile and $\leq 50^{\text{th}}$ percentile), 75.68-84.40% ($> 50^{\text{th}}$ percentile and $\leq 75^{\text{th}}$ percentile), and $> 84.40\%$ ($> 75^{\text{th}}$ percentile). Lastly, the four groups for the state-level proportion of high schools with GSAs included $\leq 42.17\%$ ($\leq 25^{\text{th}}$ percentile), 42.18-56.75% ($> 25^{\text{th}}$ percentile and $\leq 50^{\text{th}}$ percentile), 56.76-75.38% ($> 50^{\text{th}}$ percentile and $\leq 75^{\text{th}}$ percentile), and $> 75.38\%$ ($> 75^{\text{th}}$ percentile).

All state-level proportions were calculated in R using survey weights to account for the School Health Profiles survey design. Logistic regression analyses were conducted in Stata using survey weights for the YRBS.

RESULTS

In total, 118,948 high school student respondents from the YRBS were included in the study, with 31 U.S. states represented. Table 2 summarizes the demographic characteristics of the students who responded to at least one of the interpersonal violence victimization questions, and were therefore included in the analyses. Of the 118,948 students utilized throughout the analyses, 50.7% respondents were male, and 48.6% respondents were female. The students were distributed fairly equally across the different grade levels (26.4% in 9th grade, 25.3% in 10th grade, 23.9% in 11th grade, and 23.4% in 12th grade). Most students identified as White (45.7%) or Hispanic/Latino (27.2%) and heterosexual (72.8%).

Table 3 summarizes the unadjusted and adjusted associations between state-level proportions of high school programs related to inclusivity and adolescent self-reported interpersonal violence victimization. All estimates reported in the text are adjusted for relevant state-level covariates.

Health and safety program/activities coordinator

Having a 10% greater state-level proportion of high schools with a *health and safety program/activities coordinator* was associated with 15% higher odds of a student self-reporting lifetime forced sexual intercourse victimization [aOR=1.15, 95% CI=1.02-1.29], 45% higher odds of a student self-reporting past-year physical TDV victimization [aOR=1.45, 95% CI=1.27-1.65], and 1% higher odds of a student self-reporting past-year bullying victimization experienced electronically [aOR=1.01, 95% CI=0.91-1.12].

Having a 10% greater state-level proportion of high schools with a *health and safety program/activities coordinator* was associated with 13% lower odds of a student self-reporting past-year SV victimization [aOR=0.87, 95% CI=0.72-1.05], 9% lower odds of a student self-reporting past-year sexual TDV victimization [aOR=0.91, 95% CI=0.77-1.06], and 1% lower odds of a student self-reporting past-year bullying victimization experienced at school [aOR=0.99, 95% CI=0.89-1.11].

Clubs that give students opportunities to learn about people different from them

Having a 10% greater state-level proportion of high schools with *clubs that give students opportunities to learn about people different from them* was associated with 5% higher odds of a student self-reporting past-year SV victimization [aOR=1.05, 95% CI=0.96-1.16] and 2% higher odds of a student self-reporting past-year sexual TDV victimization [aOR=1.02, 95% CI=0.96-1.09].

Having a 10% greater state-level proportion of high schools with *clubs that give students opportunities to learn about people different from them* was associated with 10% lower odds of a student self-reporting lifetime forced sexual intercourse victimization [aOR=0.90, 95% CI=0.86-0.96], 6% lower odds of a student self-reporting past-year physical TDV victimization [aOR=0.94, 95% CI=0.89-1.00], 4% lower odds of a student self-reporting past-year bullying

victimization experienced at school [aOR=0.96, 95% CI=0.90-1.02], and 8% lower odds of a student self-reporting past-year bullying victimization experienced electronically [aOR=0.92, 95% CI=0.88-0.96].

Gay-straight alliance clubs (GSAs)

Having a 10% greater state-level proportion of high schools with GSAs was associated with 1% higher odds of a student self-reporting past-year TDV victimization [Sexual TDV: aOR=1.01, 95% CI=0.98-1.04 | Physical TDV: aOR=1.01, 95% CI=0.98-1.05].

Having a 10% greater state-level proportion of high schools with GSAs was associated with 9% lower odds of a student self-reporting lifetime forced sexual intercourse victimization [aOR=0.91, 95% CI=0.89-0.94], 2% lower odds of a student self-reporting past-year SV victimization [aOR=0.98, 95% CI=0.96-1.01], 3% lower odds of a student self-reporting past-year bullying victimization experienced at school [aOR=0.97, 95% CI=0.95-0.99], and 2% lower odds of a student self-reporting past-year bullying victimization experienced electronically [aOR=0.98, 95% CI=0.96-1.01].

Effect Modification Analyses

All measures of association calculated for specific sub-groups are included in Figure 1. We found a statistically significant interaction for having a 10% greater state-level proportion of high schools with a *health and safety program/activities coordinator* and race for sexual TDV victimization and calculated measures of association for students who identified as White [aOR=0.78, 95% CI=0.63, 0.98], Hispanic/Latino [aOR=0.78, 95% CI=0.54, 1.13], Black or African American [aOR=1.86, 95% CI=1.18, 2.94], and all other races [aOR=0.99, 95% CI=0.64, 1.53]. We also found a statistically significant interaction for this exposure and sex for

SV victimization and calculated measures of association for students who identified as male [aOR=0.88, 95% CI=0.58, 1.32] and female [aOR=0.84, 95% CI=0.73, 0.96].

Next, we found a statistically significant interaction for having a 10% greater state-level proportion of high schools with *clubs that give students opportunities to learn about people different from them* and race for forced sexual intercourse victimization and calculated measures of association for students who identified as White [aOR=0.89, 95% CI=0.82, 0.95], Hispanic/Latino [aOR=0.92, 95% CI=0.84, 1.02], Black or African American [aOR=0.74, 95% CI=0.64, 0.85], and all other races [aOR=0.96, 95% CI=0.86, 1.08]. We also found a statistically significant interaction for this exposure and sexual identity for bullying victimization experienced at school and calculated measures of association for students who identified as *not sure* for their sexual identity [aOR=0.94, 95% CI=0.79, 1.11], heterosexual [aOR=0.99, 95% CI=0.93, 1.07], gay or lesbian [aOR=0.96, 95% CI=0.79, 1.17], and bisexual [aOR=0.87, 95% CI=0.78, 0.96]. In addition, we found a statistically significant interaction for this exposure and sex for SV victimization and calculated measures of association for students who identified as male [aOR=1.12, 95% CI=0.94, 1.34] and female [aOR=1.01, 95% CI=0.94, 1.09].

Then, we found a statistically significant interaction for having a 10% greater state-level proportion of high schools with GSAs and race for forced sexual intercourse victimization and calculated measures of association for students who identified as White [aOR=0.93, 95% CI=0.89, 0.98], Hispanic/Latino [aOR=0.92, 95% CI=0.87, 0.97], Black or African American [aOR=0.78, 95% CI=0.72, 0.84], and all other races [aOR=0.97, 95% CI=0.91, 1.04]. We also found a statistically significant interaction for this exposure and sexual identity for bullying victimization experienced at school and calculated measures of association for students who identified as *not sure* for their sexual identity [aOR=0.95, 95% CI=0.87, 1.04], heterosexual

[aOR=0.97, 95% CI=0.95, 1.00], gay or lesbian [aOR=0.94, 95% CI=0.84, 1.06], and bisexual [aOR=0.94, 95% CI=0.89, 1.00].

Sensitivity Analyses

Sensitivity analyses were conducted with different ways of measuring the exposure variable. Unadjusted and adjusted models were fit with the state-level proportions that included the extra middle school data, and we did not detect substantial changes with the results. Supplemental Table 2 includes the results from this sensitivity analysis. With the sensitivity analysis examining high school data as a categorical variable, we discovered different results when comparing this sensitivity analysis to the primary analysis. For example, having a state-level proportion of high schools with a *health and safety program/activities coordinator* that was > 25th percentile and ≤ 50th percentile was associated with lower odds of a student self-reporting physical TDV victimization [aOR=0.98, 95% CI=0.84, 1.15] compared to having a state-level proportion that was ≤ 25th percentile. However, having a state-level proportion that was > 50th percentile and ≤ 75th percentile or > 75th percentile was associated with higher odds of a student self-reporting physical TDV [aOR=1.12, 95% CI=0.97, 1.30 | aOR=1.50, 95% CI=1.32, 1.70, respectively] compared to having a state-level proportion that was ≤ 25th percentile. Supplemental Table 3 includes all results from this sensitivity analysis.

DISCUSSION

Overall, we found some associations between school programs that promote inclusivity and adolescent self-reported interpersonal violence victimization, though the associations were not all in the hypothesized direction. This research builds on previous literature by examining the association of interpersonal violence victimization with school programs that give students opportunities to learn about students with disabilities, unhoused youth, or people from different

cultures, in addition to continuing to examine the outcomes associated with GSAs.^{8,10,19,20} These are programs that promote inclusivity among students and therefore, could be a proxy for school climate. Furthermore, this study adds to the body of knowledge by examining the association between the presence of a health and safety program coordinator at the school and violence victimization for high school students.

A higher state-level proportion of high schools with a *health and safety program/activities coordinator* was associated with higher odds of a high school student self-reporting interpersonal violence victimization for some forms of violence, but not for others. To our knowledge, there are no other studies that looked at this association and further research should be done to understand the mechanisms behind this association given that it has not been well studied. There may have been higher rates of interpersonal violence victimization, in general, across some schools and therefore a health and safety program/activities coordinator was hired to mitigate these concerns. Since the study was cross-sectional, it remains unclear if the presence of a health and safety program/activities coordinator occurred before or after higher reports of interpersonal violence victimization.

Similarly, a higher state-level proportion of high schools with GSAs and *clubs that give students opportunities to learn about people different from them* were associated with higher and lower odds of a high school student self-reporting interpersonal violence victimization. We found that higher state-level proportions of high schools with GSAs were associated with lower odds of a student self-reporting lifetime forced sexual intercourse victimization, which aligns with previous literature examining this association for students.⁸ In general, the direction of the associations we found for GSAs and interpersonal violence victimization were similar to what Cruz et al. have reported, particularly for lifetime forced sexual intercourse victimization and

bullying victimization.⁸ However, research by Kaczkowski et al. reported a stronger association between GSAs and lower odds of self-reporting lifetime forced sexual intercourse victimization for heterosexual students than for students with diverse sexual identities.¹⁰ Other research demonstrated that GSAs are protective for students with diverse sexual identities, and that students who have GSAs at their school report less bullying due to their sexual identity.¹⁹ Though, a different study reported that schools with these clubs had higher reports of harassment based on sexual and gender identity.²¹ Our adjusted model did not detect a significant interaction between GSAs and sexual identity for lifetime forced sexual intercourse. However, our adjusted model did detect a significant interaction between GSAs and sexual identity for bullying victimization experienced at school, with the association between having a 10% greater state-level proportion of high schools with GSAs and lower odds of self-reporting bullying victimization being greater for students with diverse sexual identities. Though these studies are examining similar associations, Cruz et al. examined data in New Mexico and Kaczkowski et al. examined data at local education agencies.^{8,10} In addition, for the studies examining GSAs and bullying on the basis of sexual identity, one study used a cross-sectional dataset while the other study used a longitudinal dataset.^{19,21} These methodological differences could contribute to different findings across these studies and in comparison to our study examining state-level cross-sectional data. While research has demonstrated that the presence of LGBTQ+ inclusive programming at school is beneficial for the safety and well-being of all students, accessibility of and engagement in LGBTQ+ inclusive programs and resources are also an important strategy for fostering an empowering and inclusive school environment.^{20,22,23} Future research should continue to examine ways these programs can be implemented in an impactful way that reduces violence victimization for all students, and that students with diverse identities are protected.²²

Further analyses were done with different demographic information as potential effect modifiers to examine if school programs impact certain groups differently. Prior studies have examined how inclusive education, such as LGBTQ+-inclusive sexual health education, is associated with lower reports of bullying victimization for students across all sexual identities.⁹ Though the questionnaire prompts for *clubs that give students opportunities to learn about people different from them* included examples such as *students with disabilities, homeless youth, or people from different cultures*, we found that this was associated with lower odds of self-reported bullying victimization, and that this association was particularly salient for students who identified as bisexual. In addition, having a 10% greater state-level proportion of high schools with *clubs that give students opportunities to learn about people different from them* was associated with lower odds of self-reporting lifetime forced sexual intercourse victimization, and this association was greater for students who identified as Black or African American. Though our adjusted model did not detect significant interactions with *clubs that give students opportunities to learn about people different from them* and race/ethnicity for bullying victimization, prior research examining this same exposure (among other diversity education and clubs) found varied associations for people with diverse racial and ethnic identities.²⁴ Inclusive education is important for the wellbeing of all students, but particularly students with diverse identities, and can be associated with lower reports of some forms of interpersonal violence victimization. Future research should be done to examine why certain students may or may not benefit from school programs and policies.

The results of this research should be interpreted considering some limitations. First, the study design is cross-sectional, which means we cannot infer causation. Second, the School Health Profiles data may be overestimating school programs/staff members since principals may

view it as more desirable to report more school programs/staff members. Third, violence victimization may be underreported by students in the YRBS for a variety of reasons including parental opt-outs for surveys and youth not considering certain behaviors to be abusive, harassment, or bullying. Fourth, there may be misclassification of the exposure since a higher state-level proportion of school programs/staff members does not necessarily mean that the student's specific school had the same school programs/staff members. However, absent school-level data, state-level data can provide us information about the likelihood of schools within a particular state to have certain programs or staff members. Fifth, there could be residual confounding due to information that was not available with these datasets. For example, the length of the programs at the school or the participation by students in these programs would be additional factors to consider in the analysis if such information was available, since these could be indicators of program strength and visibility. Sixth, as we saw in the sensitivity analysis examining the exposure variables as a categorical variable rather than a continuous variable, there may be a non-linear association between school programs related to inclusivity and violence victimization.

Overall, our research found associations between school programs and staff roles that promote safety and inclusivity and adolescent self-reported interpersonal violence victimization that differed in direction and magnitude. School climate and programs do have an impact on interpersonal violence in schools, and further research should be done to further understand the mechanisms behind these associations. Future research should also evaluate school programs and policies to further understand these specific relationships and ensure that there is an equitable and evidence-based approach to addressing interpersonal violence among youth in schools.

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TABLES

Table 1: School Health Profiles Exposure Questions and Youth Risk Behavior Survey Outcome Questions

Exposure/Outcome	Question	Coding for analysis
2018 School Health Profiles Questions (Exposures)		
Health and safety program/activities coordinator	Currently, does someone at your school oversee or coordinate school health and safety programs and activities?	Continuous (proportion calculated to represent the % of schools in each state with this staff member)
Clubs that give students opportunities to learn about people different from them	Does your school have any clubs that give students opportunities to learn about people different from them, such as students with disabilities, homeless youth, or people from different cultures?	Continuous (proportion calculated to represent the % of schools in each state with this program)
Gay-straight alliance clubs (GSAs)	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.	Continuous (proportion calculated to represent the % of schools in each state with this program)
2019 Youth Risk Behavior Survey Questions (Outcomes)		
Forced sexual intercourse	Have you ever been physically forced to have sexual intercourse when you did not want to?	Dichotomous (yes/no)
SV	During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such	Dichotomous (yes/no)

things as kissing, touching, or being physically forced to have sexual intercourse.)

Sexual TDV

During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)

Dichotomous
(yes/no)

Physical TDV

During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon.)

Dichotomous
(yes/no)

Bullying
(experienced at school)

During the past 12 months, have you ever been bullied on school property?

Dichotomous
(yes/no)

Bullying
(experienced electronically)

During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)

Dichotomous
(yes/no)

SV = sexual violence.
TDV = teen dating violence.

Table 2: Demographic Information, 2019 Youth Risk Behavior Survey, N=118,948

Demographic	n	Weighted %
Sex		
Male	58,361	50.7
Female	59,565	48.6
<i>Missing</i>	<i>1,022</i>	<i>0.7</i>
Grade		
9 th	33,742	26.4
10 th	31,377	25.3
11 th	28,724	23.9
12 th	23,743	23.4
<i>Missing</i>	<i>1,362</i>	<i>1.0</i>
Race/Ethnicity		
Black or African American	12,659	14.6
Hispanic/Latino	20,938	27.2
White	65,765	45.7
All other races	16,429	9.9
<i>Missing</i>	<i>3,157</i>	<i>2.6</i>
Sexual Identity		
Bisexual	9,641	7.7
Gay or Lesbian	3,036	2.6
Heterosexual	85,576	72.8
Not sure	5,101	3.9
<i>Missing</i>	<i>15,594</i>	<i>13.0</i>

Table 3: Associations Between State-Level Proportions of High School Programs/Staff Roles Related to Safety and Inclusivity and Adolescent Self-Reported Interpersonal Violence Victimization

	Forced sexual intercourse	SV	Sexual TDV	Physical TDV	Bullying (school)	Bullying (electronically)
OR [95% Confidence Interval]						
Health and safety program/activities coordinator						
Unadjusted	1.09 [0.97, 1.22]	1.06 [0.98, 1.15]	1.02 [0.90, 1.15]	1.36 [1.19, 1.55]	1.04 [0.96, 1.14]	1.02 [0.93, 1.12]
Adjusted	1.15 [1.02, 1.29]	0.87 [0.72, 1.05]	0.91 [0.77, 1.06]	1.45 [1.27, 1.65]	0.99 [0.89, 1.11]	1.01 [0.91, 1.12]
Clubs that give students opportunities to learn about people different from them						
Unadjusted	0.90 [0.84, 0.96]	1.19 [0.97, 1.46]	1.04 [0.98, 1.11]	0.90 [0.84, 0.96]	1.04 [0.93, 1.17]	0.96 [0.92, 1.01]
Adjusted	0.90 [0.86, 0.96]	1.05 [0.96, 1.16]	1.02 [0.96, 1.09]	0.94 [0.89, 1.00]	0.96 [0.90, 1.02]	0.92 [0.88, 0.96]
Gay-straight alliance clubs (GSAs)						
Unadjusted	0.93 [0.90, 0.97]	1.10 [0.99, 1.23]	1.05 [1.02, 1.09]	0.95 [0.92, 0.99]	1.04 [0.98, 1.11]	1.01 [0.98, 1.03]
Adjusted	0.91 [0.89, 0.94]	0.98 [0.96, 1.01]	1.01 [0.98, 1.04]	1.01 [0.98, 1.05]	0.97 [0.95, 0.99]	0.98 [0.96, 1.01]

SV = sexual violence.

TDV = teen dating violence.

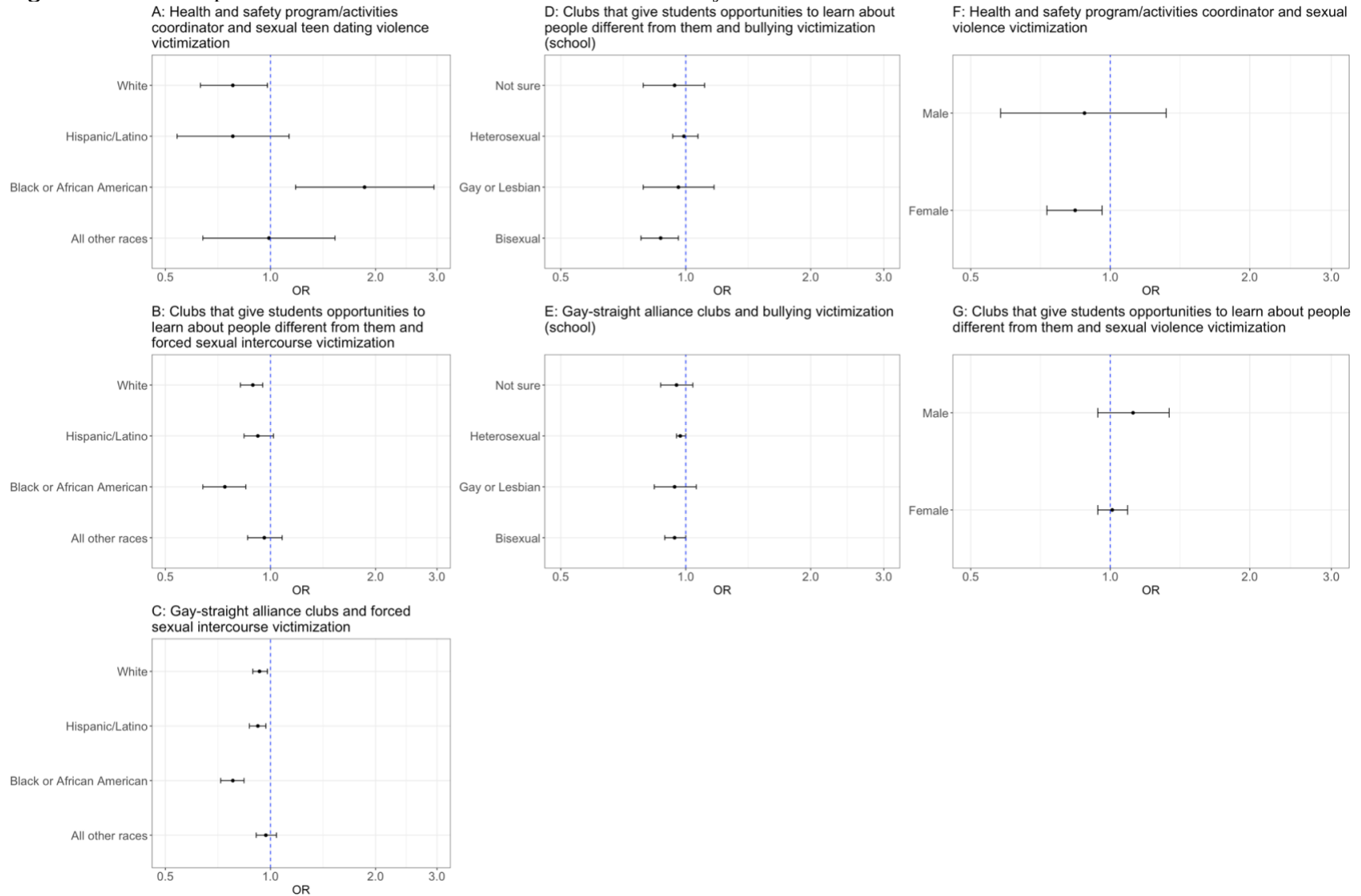
Results in bold indicate statistical significance at $p < 0.05$.

State-level proportions were calculated from the 2018 School Health Profiles data using high schools only and were scaled to represent a 10% change.

Forced sexual intercourse refers to lifetime victimization. SV, sexual TDV, physical TDV, bullying (school) and bullying (electronically) refers to past-year victimization.

Adjustment variables included 2015 median household income and 2015 Overall State Policy Tallies.

Figure 1: Stratum-Specific Odds Ratios for Effect Modification Analyses



State-level proportions were calculated from the 2018 School Health Profiles data using high schools only and were scaled to represent a 10% change. Adjustment variables included 2015 median household income and 2015 Overall State Policy Tallies.