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RESEARCH ARTICLE

School Safety Among Sexual and Gender Minority Adolescents: Implications for Eating and Weight Control Behaviors

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ABSTRACT

BACKGROUND: Unhealthy weight control and disordered eating behaviors are prevalent among adolescents who identify as a gender and/or sexual minority (SGM). The current study examined how perceptions of school safety contribute to reduced negative weight control and eating behaviors across adolescents with diverse sexual and gender identities.

METHODS: Data on perceptions of school safety, as well as negative weight control and disordered eating behaviors (ie, binge eating, eating to cope), were drawn from a large national sample of SGM secondary school students (ie, grades 7-12; N = 17,112; *LGBTQ National Teen Survey*).

RESULTS: Differences in negative weight control and disordered eating behaviors emerged as a function of gender identity and sexual orientation. School safety was significantly associated with fewer negative weight control behaviors ($B = -0.30$, $p < .001$), reduced binge eating ($B = -0.19$, $p < .001$), and less eating to cope ($B = -0.21$, $p < .001$). Despite slight variation in the strength of these associations, the protective effects of school safety were significant across sexual and gender identities.

CONCLUSIONS: Findings suggest that efforts to support feelings of school safety among SGM students are likely to have positive implications for eating and weight-related behaviors, and emphasize the need for interventions to promote climates of safety and inclusion within the school setting.

Keywords: school safety; sexual and gender minority; adolescence; eating behaviors; unhealthy weight control.

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Unhealthy weight control behaviors (UWCBs) become especially prominent during the adolescent years—a time of heightened appearance concern[1] and increased risk for the development of eating disorders.[2] UWCBs are particularly common among adolescents who identify as a sexual and/or gender minority (SGM).[3-6] The disproportionate prevalence of UWCBs among SGM adolescents, presumed to manifest as a result of disparate SGM social stress and mistreatment,[7,8] is concerning given that weight control and disordered eating in adolescence is predictive of overweight[9] and compromised health (eg, depressive symptoms) over time.[10] Thus, it is crucial to understand protective approaches to reduce the prevalence and frequency of UWCBs among SGM adolescents. Recognizing the school setting as a primary developmental context with the potential to turn up or dial down health risks,[11,12] the present investigation focuses on the role of school safety and its potential to minimize UWCBs and disordered eating (eg, binge eating and eating to cope) among a large national sample of SGM adolescents in the United States.

UWCBs are especially common among SGM adolescents relative to their non-SGM peers. For example, both- and same-sex partnered male adolescents are

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more likely to report engaging in fasting, taking diet pills, and self-induced vomiting to lose weight compared to their opposite-sex partnered counterparts.[6] In addition, among national samples of U.S. adolescents, sexual minority males have been found to be more likely than heterosexual males to report both binge eating and purging behaviors.[3,4] Another study found that SGM secondary school students were more likely to engage in negative weight control behaviors than their heterosexual cisgender peers.[5] Less is known about variation in weight control and disordered eating behaviors across diverse sexual and gender identities because that requires large samples of SGM adolescents. However, one study found that compared to heterosexual adolescent males and females, those who identified as ''mostly heterosexual,'' and bisexual were more likely to report binge eating and purging.[4]

Growing evidence implicates social mistreatment as a significant contributor to SGM adolescents' disproportionate experiences of UWCBs and disordered eating. Relative to their heterosexual peers, adolescents who identify as LGBQ are twice as likely to be bullied at school,[13] and transgender students are at even greater risk for victimization in the school setting than others who identify as LGBTQ.[14] Moreover, evidence from the National School Climate Survey indicates that a majority of LGBTQ youth report feeling unsafe at school.[15] Based on minority stress framework,[8] whereby disparate social mistreatment drives SGM health disparities, consistent social stress can lead to maladaptive coping behaviors, including UWCBs and disordered eating. Indeed, cross-sectional evidence has linked SGM adolescents' experiences of targeted[16] and generalized[17] school-based victimization with UWCBs (eg, fasting; vomiting; using diet pills, powders, or liquids, laxatives, or cigarettes; skipping meals). Moreover, longitudinal data from the Growing Up Today Study, indicates that sexual minority stressors predict unhealthy eating behaviors (ie, coping-motivated eating, disinhibited eating) among mostly heterosexual female youth.[18] Insofar as unhealthy eating behaviors among SGM adolescents manifest (in part) as a function of negative school-based social experiences, the extent to which SGM feel safe in school may play an important role in mitigating these behaviors.

Despite robust evidence for benefits of school safety in promoting health and well being for SGM youth,[19,20] little is known about whether school safety can contribute to reduced UWCBs and disordered eating among SGM youth. One recent study found that secondary school students, regardless of gender identity, who felt safer at school reported fewer unhealthy eating habits (eg, frequency of drinking soda, eating French fries); yet, the association between school safety and healthy eating habits (eg, frequency of eating vegetables and fruit) was stronger for transgender students compared to their nontransgender peers.[21] Beyond links between school safety and dietary intake, much remains unknown about how perceptions of safety at school contribute to UWCBs and disordered eating among SGM adolescents, and whether these associations may vary across diverse sexual and gender identities. Given the growing evidence of considerable heterogeneity among SGM youth,[22] to support healthy outcomes across diverse sexual and gender identities, it is important to test whether and how school safety may function differently based on sexual and gender identity.

The Current Study

Two primary aims guided the present investigation. First, we sought to examine variation in UWCBs and disordered eating across adolescents with diverse sexual and gender identities. Despite a heightened prevalence of weight control and disordered eating behaviors among SGM adolescents relative to their non-SGM peers, far less is known about within-SGM heterogeneity in such behaviors. Second, to understand protective approaches to reduce UWCBs and disordered eating among SGM adolescents, we explored the role of school safety. Grounded in minority stress theory,[8] we expected that SGM youth who felt safer at school would engage in fewer negative weight control and disordered eating behaviors. To test the degree to which school safety may support healthy eating and weight-related behaviors broadly across diverse sexual and gender identities, we tested whether associations between perceptions of school safety and UWCBs varied as a function of students' sexual and gender identities. Together these aims were tested among a large, heterogeneous sample of SGM adolescents in the United States, which provides enhanced generalizability and unique insight into the role schools play in supporting SGM health.

METHODS

Participants

The present investigation relied on data from the *LGBTQ National Teen Survey*, a large web-based study of SGM adolescents assessing interpersonal relationships, school characteristics, health and wellness, and assorted other subjects (N = 17,112).[22] Participants were between the ages of 13 and 17 (mean = 15.57, SD = 1.27), identified as LGBTQ, spoke English, and were currently living in the United States at the time of the survey. Seventy-two percent of the sample indicated that they were assigned female at birth, and gender identity revealed that two-thirds of participants (67%) were cisgender. Based on self-reported ethnoracial identity, the sample was 62%

white, 11% Latino/a, 6% Black/African American, 4% Asian American, and 17% from other ethnoracial identities. In addition, the sexual identity breakdown of the sample was as follows: 37% Gay/Lesbian, 35% Bisexual, 13% Pansexual, 4% Asexual, 4% Queer, 3% Questioning, 2% Straight, and 2% another sexual identity.

Procedure

The data was collected from the *LGBTQ National Teen Survey*, in partnership with the Human Rights Campaign (HRC), from April to December 2017. Participants were recruited from HRC's networks, community partners, and social media. The incentive for participation included a raffle for gift cards and HRC wristbands.[22] All procedures were approved by the authors' Institutional Review Board. Additional details describing study recruitment procedures, data collection, and cleaning are published elsewhere.[22]

Instrumentation

Negative weight control behaviors. Participants indicated how often during the past year they engaged in the following behaviors in order to lose weight or keep from gaining weight: fasted, ate very little food, took diet pills, made myself throw up (vomit), used laxatives, used diuretics, used food substitute (powder/special drink), skipped meals, smoked more cigarettes. The 9 items, drawn from Project EAT (a longitudinal cohort study investigating eating and activity behaviors among an ethnically and socioeconomically diverse sample of young people),[23] were rated on a 4-point scale (0 = never—3 = on a regular basis) and averaged into a composite mean score ($\alpha = 0.79$).

Binge eating. To measure binge eating, students responded to 4 questions assessing prevalence of binge eating (yes/no), loss of control (yes/no), frequency of loss of control binge eating (nearly every day—less than once a month), and frequency of distress over binge eating (not at all—a lot).[9] These items were combined into a total score ranging from 1 to 4, and reverse coded such that higher scores reflect more binge eating severity.

Eating to cope. Participants reported the frequency in which they eat as a means of avoidance or to cope with negative emotions using 5 items from the coping subscale of the Motivations to Eat Scale.[24] Items were rated on a 5-point scale (0 = almost never/never—4 = almost always/always) and averaged to create a composite score ($\alpha = 0.91$).

School safety. To assess perceptions of safety at school, students responded to 8-items from the British Columbia Adolescent Health Survey[25] which measure how safe youth feel in different school locations (eg, cafeteria, hallways, bathroom, library, stairwells). Items were rated on a 5-point scale (0 = never—4 = always) and calculated into a mean composite score ($\alpha = 0.91$).

Sexual and gender identities. Participants selected their sexual identity from a series of response options: ''Gay or Lesbian,'' ''Bisexual,'' ''Straight, that is, not gay,'' or ''Something else.'' Those who indicated ''something else'' went on to select one of the following: ''Queer,'' ''Pansexual,'' ''Asexual,'' ''Questioning,'' and ''Other.'' In addition, students reported on their gender identity (ie, male, female, transgender boy/girl, non-binary, gender queer, or something else), which was compared against their sex assigned at birth to differentiate cisgender (eg, a female assigned at birth identifying as female) from transgender (eg, a female assigned at birth identifying as transgender or gender queer) youth.

Covariates. Several control variables were used in the analyses. Students reported their sex assigned at birth (male/female) and race/ethnicity, which was represented by 4 dummy variables (Black/African American, Asian, Latino/a, other race/ethnicity) with white, the largest racial/ethnic group in the sample, as the comparison group. In addition, students' age was included as a covariate, as well as body mass index (BMI) percentile which was computed based on the Centers for Disease Control growth charts using participants' self-reported height, weight, age, and sex assigned at birth (mean = 65.50, SD = 30.49).

Analytic Strategy

Descriptive analyses were performed in SPSS, version 27, and regression models were conducted using Mplus version 8.0. Multiple analysis of variance models were examined first to explore differences in UWCBs and perceived school safety as a function of sex assigned at birth, gender identity, and sexual identity. Next, linear regressions were built in a 2-stage process to examine the main and interactive effects of school safety and sexual and gender identity on the weight control and eating behavior outcomes, while controlling for sex assigned at birth (0 = male, 1 = female) and race/ethnicity (dummy coded as described above), as well as BMI percentile and age. Main effects of the covariates and main predictors are interpreted first for each weight control and eating behavior outcome (Model 1), followed by the interactive effects (Model 2). Specifically, differential effects of school safety as a function of sexual and gender identity were tested by adding 7 Sexual Identity X School Safety (eg, Bisexual X Safety) and one Gender Identity X School Safety (ie, Transgender X Safety) interaction term to the main effect models. Full information maximum likelihood (FIML) estimation was used for missing data handling; however, the same

Table 1. **Unhealthy Weight Control, Eating Behaviors and School Safety Stratified by Sex Assigned at Birth, Gender Identity, and Sexual Identity**

	Negative Weight Control Behaviors Mean (SD)	Binge Eating Mean (SD)	Eating to Cope Mean (SD)	School Safety Mean (SD)
Sex assigned at birth				
Male	0.39[a] (0.45)	1.95[a] (1.11)	1.35[a] (1.09)	3.00[a] (0.82)
Female	0.53[b] (0.49)	2.16[b] (1.14)	1.66[b] (1.07)	2.83[b] (0.82)
Gender identity				
Cisgender	0.44[a] (0.44)	2.04[a] (1.12)	1.51[a] (1.07)	3.06[a] (0.74)
Transgender	0.60[b] (0.53)	2.25[b] (1.13)	1.71[b] (1.09)	2.51[b] (0.85)
Sexual identity				
Gay/lesbian	0.44[a] (0.47)	2.00[a] (1.12)	1.47[a] (1.10)	2.95[a] (0.81)
Bisexual	0.50[b] (0.48)	2.15[be] (1.14)	1.63[b] (1.06)	2.96[a] (0.78)
Straight	0.54[bc] (0.53)	2.02[ab] (1.16)	1.40[a] (1.09)	2.69[bdef] (0.92)
Queer	0.52[b] (0.48)	2.25[c] (1.09)	1.73[cd] (1.01)	2.76[bc] (0.79)
Pansexual	0.58[cd] (0.50)	2.29[c] (1.14)	1.74[c] (1.07)	2.60[d] (0.86)
Asexual	0.49[b] (0.48)	2.03[ad] (1.11)	1.50[a] (1.08)	2.73[ceg] (0.80)
Questioning	0.55[bc] (0.49)	2.19[bcd] (1.14)	1.57[abd] (1.08)	2.81[cf] (0.82)
Other	0.64[d] (0.52)	2.25[ce] (1.13)	1.70[bc] (1.11)	2.63[dg] (0.87)

Values within the same column and demographic category sharing the same letter are not significantly different from each other.

pattern of results emerged when handling missing data using listwise deletion.

RESULTS

Descriptive Information

Three-quarters of the sample (74.7%) reported engaging in at least one negative weight control behavior. Means and SDs for the weight control and eating behavior outcomes are displayed in Table 1 as a function of sex assigned at birth, gender identity, and sexual identity. Independent samples t tests revealed more negative weight control behaviors (sex assigned at birth: $t(4957.15) = -14.60$, $p < .001$; gender: $t(6735.68) = -15.62$, $p < .001$), eating to cope (sex assigned at birth: $t(10915) = -12.68$, $p < .001$; gender: $t(10915) = -9.47$, $p < .001$), and binge eating (sex assigned at birth: $t(4693.14) = -8.56$, $p < .001$; gender: $t(11026) = -9.56$, $p < .001$) among females (relative to males) and transgender youth (compared to their cisgender counterparts). In addition, one way analyses of variance revealed sexual identity differences in negative weight control behaviors [$F(7,11039) = 17.40$, $p < .001$], binge eating [$F(7,11020) = 14.44$, $p < .001$], and eating to cope [$F(7,10909) = 14.91$, $p < .001$]. Notably, pansexual youth reported consistently high levels of negative weight control and eating behaviors, whereas youth identifying as gay or lesbian reported less negative outcomes relative to their SGM peers.

When considering school safety, similar differences emerged. Specifically, female ($t(11433) = 9.94$, $p < .001$) and transgender ($t(7206.14) = 34.10$, $p < .001$) youth reported feeling less safe in school relative to their male, and cisgender counterparts, respectively. Further, perceptions of school safety varied as a function of sexual identity ($F(7,11427) = 43.58$, $p < .001$); pansexual youth perceived the lowest levels of school safety, while bisexual and gay or lesbian youth reported feeling the safest in school.

Regression Models

Table 2 presents a summary of the regression models testing the buffering role of school safety on the negative weight control and eating behavior outcomes as a function of sexual and gender identity. Covariate effects emerged such that youth assigned female at birth and those with higher BMI reported more negative weight control behaviors, binge eating, and eating to cope. Although race/ethnicity was inconsistently related to the weight control and eating outcomes, a positive association between age and negative weight control behaviors, as well as eating to cope, emerged. In addition, whereas links between sexual identity and the weight control and eating outcomes primarily aligned with the unadjusted associations (described above), gender identity was uniquely linked only with negative weight control behaviors after accounting for the full set of predictors. Finally, when turning to the main effects of school safety, over and above the covariates, youth who reported feeling safer at school reported engaging in fewer negative weight control behaviors ($B = -0.30$, $p < .001$), reduced binge eating ($B = -0.19$, $p < .001$), and less eating to cope ($B = -0.21$, $p < .001$).

As displayed in Model 2 across each of the weight control and eating behavior outcomes, few interactive effects emerged. Notably, the negative association between school safety and negative weight control behaviors as well as binge eating and eating to cope did not vary as a function of sexual identity, with 2 exceptions. Specifically, relative to youth identifying

Table 2. **Main and Interactive Effects of Sexual and Gender Identity, and School Safety on the Negative Weight Control and Eating Behavior Outcomes**

	Negative Weight Control Behaviors		Binge Eating		Eating to Cope	
Predictors	**Model 1 *B* (SE)**	**Model 2 *B* (SE)**	**Model 1 *B* (SE)**	**Model 2 *B* (SE)**	**Model 1 *B* (SE)**	**Model 2 *B* (SE)**
Sex assigned at birth (male)						
Female	0.08*** (0.01)	0.08*** (0.01)	0.02* (0.01)	0.02* (0.01)	0.08*** (0.01)	0.08*** (0.01)
Race/ethnicity (white)						
Black/African American	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)	−0.02 (0.01)	−0.02 (0.01)
Asian	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)	0.00 (0.01)	0.00 (0.01)
Latino/a	0.03** (0.01)	0.03** (0.01)	0.01 (0.01)	0.01 (0.01)	−0.02* (0.01)	−0.02* (0.01)
Other race/ethnicity	0.05*** (0.01)	0.05*** (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Age	0.06*** (0.01)	0.06*** (0.01)	−0.01 (0.01)	0.00 (0.01)	0.05*** (0.01)	0.05*** (0.01)
BMI percentile	0.17***(0.01)	0.17*** (0.01)	0.21*** (0.01)	0.21*** (0.01)	0.16*** (0.01)	0.16*** (0.01)
Sexual identity (gay/lesbian)						
Straight	−0.01 (0.01)	−0.01 (0.01)	−0.02 (0.01)	−0.02 (0.01)	−0.03** (0.01)	−0.03** (0.01)
Bisexual	0.03* (0.01)	0.03* (0.01)	0.04***(0.01)	0.04***(0.01)	0.04***(0.01)	0.04** (0.01)
Queer	−0.01 (0.01)	−0.01 (0.01)	0.03** (0.01)	0.02* (0.01)	0.02* (0.01)	0.02* (0.01)
Pansexual	0.01 (0.01)	0.02 (0.01)	0.04** (0.01)	0.04***(0.01)	0.03* (0.01)	0.03** (0.01)
Asexual	−0.02* (0.01)	−0.02* (0.01)	−0.01 (0.01)	−0.01 (0.01)	−0.02* (0.01)	−0.02* (0.01)
Questioning	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)
Other sexual identity	0.02* (0.01)	0.03** (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Gender identity (cisgender)						
Transgender	0.04*** (0.01)	0.03** (0.01)	0.01 (0.01)	0.02 (0.01)	0.00 (0.01)	0.01 (0.01)
School safety	−0.30*** (0.01)	−0.27*** (0.02)	−0.19*** (0.01)	−0.22*** (0.02)	−0.21*** (0.01)	−0.29*** (0.02)
Sexual identity × safety						
Straight × school safety		0.00 (0.01)		0.00 (0.01)		0.02 (0.01)
Bisexual × school safety		−0.01 (0.02)		0.02 (0.01)		0.04** (0.01)
Queer × school safety		0.00 (0.01)		0.00 (0.01)		0.02 (0.01)
Pansexual × school safety		0.02 (0.02)		0.02 (0.01)		0.04* (0.01)
Asexual × school safety		−0.01 (0.01)		0.00 (0.01)		0.00 (0.01)
Questioning × school safety		0.01 (0.01)		0.00 (0.01)		−0.01 (0.01)
Other × school safety		0.01 (0.01)		0.01 (0.01)		0.01 (0.01)
Gender identity × safety						
Transgender × school safety		−0.05** (0.02)		0.01 (0.02)		0.06*** (0.02)

***$p < .001$; **$p < .01$; *$p < .05$.

as gay or lesbian ($b = -0.39$, $p < .001$), perceptions of school safety were less strongly associated with reduced eating to cope among bisexual ($b = -0.29$, $p < .001$) and pansexual ($b = -0.27$, $p < .001$) youth. When considering gender identity differences, although no differences were documented for binge eating, the effect of school safety on negative weight control behaviors and eating to cope varied across gender identities. Specifically, the negative association between perceived school safety and negative weight control behaviors was stronger among transgender youth ($b = -0.21$, $p < .001$) compared to their cisgender peers ($b = -0.16$, $p < .001$). In contrast, perceived school safety was less strongly linked with reduced eating to cope among transgender youth ($b = -0.26$, $p < .001$) relative to their cisgender counterparts ($b = -0.39$, $p < .001$).

Taken together, while unhealthy weight control and eating behaviors varied as a function of sexual and gender identity, school safety was consistently negatively linked to unhealthy weight control behaviors, binge eating and eating to cope. Despite slight variation in the strength of the association between perceived school safety and the weight control and eating outcomes, the protective effects of school safety were significant across sexual and gender identities.

DISCUSSION

The present findings provide important insights into the role broader contextual settings play in adolescent UWCBs and disordered eating. Whereas research examining protective factors for SGM youth health often focuses on family,[26] our results emphasize the school environment and highlight the health benefits associated with feeling safe at school. By relying on a large sample of SGM adolescents in the U.S., the study results indicate that perceptions of safety at school are associated with reduced negative weight control behaviors, binge eating, and eating to cope across diverse sexual and gender identities. When SGM adolescents feel safe at school, they are likely to face fewer stressors that illicit maladaptive coping responses, such as unhealthy weight control

and binge eating. Understanding the extent to which school safety supports healthy outcomes for students across diverse sexual and gender identities underscores the need for school-based interventions to promote climates of safety and inclusion.

Consistent with existing studies,[3-6] our findings highlight the striking prevalence of UWCBs among SGM secondary school students. Indeed, 3-in-4 students in our SGM sample reported engaging in at least one negative weight control behavior, such as vomiting, fasting or use of diuretics. These health-compromising behaviors were especially prevalent among transgender youth; it has been proposed that transgender youth may engage in disordered weight management behaviors in an attempt to maximize concordance between their physical appearance and gender identity.[27] In addition to variation based on gender, nuances in unhealthy eating behaviors also emerged across sexual identities. Notably, binge eating and eating to cope were most frequent among pansexual students. Although additional work is needed to understand the potential social origins of such eating behaviors among pansexual youth, a recent study of SGM adolescents found that the highest rates of weight-based teasing from peers were reported by those who identified as pansexual.[28] Thus, given that weight teasing has been linked prospectively to disordered eating behaviors in adolescence,[29] it may be that heightened experiences of targeted mistreatment based on body weight play a mediating role in the development of unhealthy eating behaviors among pansexual youth.

Building on the health and wellbeing benefits of school safety among all youth,[30,31] and SGM youth in particular,[20] one of the most novel findings of the current study pertains to the considerable consistency in the protective nature of school safety across diverse sexual and gender identities. While the strength of the associations between school safety and negative weight control behaviors, as well as eating to cope, varied slightly as function of gender and sexual (eating to cope only) identity, students who felt safer at school reported less frequently engaging in negative weight control behaviors and eating to cope, in addition to reduced binge eating severity. Given that adolescents' perceptions of school safety are linked with mental health,[31] and that disordered eating can function as an indicator of mental health distress,[32] it may be that associations between school safety and negative weight control and disordered eating behaviors are driven by overall psychological functioning. That is, safe and secure school environments are likely to reduce risk for internalizing distress, and in turn UWCBs and disordered eating.

Of note, the present investigation also documented nuanced findings in the interactions between school safety and the weight- and eating-related outcomes. In particular, we found that compared to cisgender youth, school safety was *more* strongly associated with negative weight control behaviors, but *less* strongly associated with eating to cope, among transgender youth. It may be that transgender youth are engaging in negative weight control behaviors in order to conform to gendered body norms,[33] and thus feeling safe at school—a context where most youth navigate peer acceptance and bullying, in particular related to appearance—may be especially protective for transgender youth. Alternatively, eating to cope with negative emotions may not be related to transgender-specific eating behaviors (eg, subduing gender features), thus an opposite direction of interaction between school safety and eating to cope.

Limitations

Several limitations should be taken into account when interpreting the study findings. For example, given the reliance on cross-sectional data, causal inference cannot be assumed. While it was presumed that feelings of school safety would precede UWCBs and disordered eating, it is also possible that youth struggling to control their weight and eating habits come to see the school environment as less safe. Longitudinal cross-lagged models would provide important insight into the temporal relations between school safety perceptions and negative weight control and eating behaviors. Secondly, despite our large, diverse SGM sample, given recruitment partnership with HRC, we cannot presume generalizability of our findings beyond youth who have and utilize access to online networks where the study was advertised by HRC. There may be differences between SGM youth who do, versus do not, engage and follow LGBTQ organizations and influencers. Finally, we relied on student-report data. Although self-reports are necessary for subjective perceptions of school safety, it would be helpful to also take into account objective school-level indicators of safety and safety within students' broader neighborhood environments, which is likely to spill over into the school setting.

IMPLICATIONS FOR SCHOOL HEALTH

The school environment is an important determinant not only of SGM students' academic functioning,[34] but also their health behaviors. The present results indicate that efforts to support feelings of school safety among SGM students are likely to have positive implications for eating and weight-related behaviors. Recognizing that school safety extends beyond the mere absence of violence,[35] in addition to minimizing direct harassment and victimization

which disproportionately targets SGM students,[13,15] schools should direct attention toward cultivating environments of inclusion and acceptance, where students across diverse sexual and gender identities feel welcome and safe. Efforts should therefore emphasize simultaneous promotion of students' physical, social, and emotional safety. Indeed, in addition to their bullying experiences, adolescents' perceptions of safety at school are also driven by positive teacher relations, sense of belongingness, consistent rules, and campus environmental characteristics (eg, cleanliness).[36] Thus, multi-tiered approaches may be most effective. That is, in addition to establishing Gay-Straight/Gender-Sexuality Alliances (GSAs), which have been shown to promote SGM students' sense of school safety through a reduction in bias-based bullying,[37] top-down messages of inclusion from school administrators, policymakers, and teachers are likely also critical. For example, school psychologists can facilitate professional development raising teachers' awareness of the ubiquity and consequences of stigma facing students with diverse sexual and gender identities, given that secondary school teachers are more supportive of LGBT students when they have received training specifically related to LGBT topics.[38] Similarly, advocacy for enumeration of sexual orientation and gender identity in school anti-bullying policies may help reduce the prevalence of bias-based bullying[15] and promote teacher intervention when such targeted mistreatment does occur.[39] To the extent that schools are able to reinforce perceptions of safety across multiple levels of influence, unhealthy weight control and eating behaviors may be be minimized across SGM students.

Human Subjects Approval Statement

This study was approved by the University of Connecticut institutional review board (IRB Protocol #H16-322). All procedures involving human participants in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed assent was obtained from all participants included in the study.

Conflict of Interest

The authors declare no conflict of interest.

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