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Unhealthy weight control behaviors among youth: Sex of sexual partner is linked to important differences

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ABSTRACT

Unhealthy weight control behaviors (UWCBs) have been decreasing for most youth over time, yet little is known whether these behaviors have changed for sexual minority (e.g., non-heterosexual) youth. This is important because many studies have found that sexual minorities report some of the highest rates of UWCBs. To determine whether or not these behaviors have changed over time, given the extreme changes in social contexts over the past two decades, we utilised three waves of the Minnesota Student Survey (N = 55,597, M_{age} = 17). In doing so, we report trends, disparities, and changes in disparities of UWCBs. Overall, the prevalence of UWCBs has declined from 1999 to 2010 for all youth, but there are alarming disparities by sex of sexual partner. We found that both- and same-sex partnered male youth were more likely to fast, use diet pills, and vomit on purpose to lose weight compared to their opposite-sex partnered counterparts in all three survey years; specifically, both-sex partnered boys were up to 5.5× as likely to vomit on purpose compared to their opposite-sex partnered counterparts. Likewise, both-sex partnered girls were more likely to use diet pills and vomit on purpose to lose weight compared to opposite-sex partnered girls in all three survey years. Additionally, the disparity in fasting to lose weight widened for the same-sex partnered females compared to the opposite-sex partnered females from 1998 to 2004. This has implications for UWCB interventions and preventions targeted specifically towards sexual minorities.

Weight control behaviors, such as fasting, self-induced vomiting, or using diet pills, stimulants, or other drugs, remain understudied among vulnerable populations. Several longitudinal studies have shown that unhealthy weight control behaviors (UWCBs) contribute to the development of eating disorders and are also predictive of future weight gain (Neumark-Sztainer, Wall,

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Story, & Standish, 2012). The data from the youth risk behavior survey (YRBS) suggests that since 1999, the proportion of students who reported engaging in UWCB in order to lose weight or keep from gaining weight generally decreased (Eaton et al., 2010; Kann et al., 2016). Although the male youth generally engage in lower levels of UWCB than female youth, this pattern varies based on a variety of factors, including sexual orientation (Austin, Nelson, Birkett, Calzo, & Everett, 2013; Austin et al., 2009; Austin, Ziyadeh, Kahn, Camargo, Colditz, & Field, 2004; CDC, 2011; Feldman & Meyer, 2007; French, Story, Remafedi, Resnick, & Blum, 1996; Katz-Wise et al., 2015; Laska et al., 2015; Matthews-Ewald, Zullig, & Ward, 2014; Rosario et al., 2014).

Pooled data from the YRBS suggest that sexual minority youth (i.e., youth with non-heterosexual identities, behaviors, and/or attractions) have about 2–7 higher odds of purging or diet pill use compared to heterosexual youth (Austin et al., 2013) with the disparity being most striking among males (Katz-Wise et al., 2015). Despite a growing body of research highlighting this important disparity in UWCB, and prioritization of this issue by the Institutes of Medicine (Institute of Medicine, 2011), this area continues to be underexplored with regard to population-based data. In addition, the existing population-based research on sexual orientation disparities in UWCB have frequently pooled groups in order to increase sample sizes, despite known differences between males and females (Watson, Adjei, Saewyc, Homma, & Goodenow, 2017).

Further, it is important to consider both differences in geographic location and trends over time when examining sexual orientation disparities in UWCB. In a recent YRBS report, the prevalence estimates of different UWCB varied based on geographic location (Centers for Disease Control and Prevention, 2011). The data from the Midwest is notably lacking, as no states that administer the YRBS in this region include both sexual orientation and UWCB items. By pooling across geographic regions, we may obscure important differences and not be able to identify and prioritize specific locations for developing and delivering interventions. Additionally, changes in the sociocultural context for sexual minority communities may influence health over time. Recently, the United States has experienced swift changes in regard to the rights of sexual minority people (Harrison & Michelson, 2017). Some of these rights include the right to marriage, adoption, and tax benefits for sexual minority couples (Harrison & Michelson, 2017). More supportive social environments for sexual minorities have been shown to improve the mental health of sexual minority youth (Hatzenbuehler, 2011; Hatzenbuehler, Birkett, Van Wagenen, & Meyer, 2014). On the one hand, perhaps there may be similar improvements in the consistent disparities in UWCB documented in sexual minority populations. On the other hand, there is still a stigma towards many sexual minority people, as explained by the minority stress

model (Hatzenbuehler, 2009; Meyer, 2003) and these sexual orientation-specific stigma can account for some of the disparities found among sexual minority populations. Might changes in social acceptance towards sexual minority people have resulted in lower rates of UWCB among this vulnerable population? By examining trends over time, we can gain important insights into changes in health that would not be captured with a single time point.

Objectification theory and minority stress

Self-objectification (Fredrickson & Roberts, 1997) refers to the tendency to view oneself from the perspective of others (i.e., as an object). In the original articulation of the theory, this tendency to view oneself from others' perspectives was hypothesized to be the result of growing up female in a heteronormative society that sexually objectifies female bodies. Initially, the objectification theory focused on heterosexual women who were hypothesised to experience heterocentric sexual objectification, and therefore have more eating disorders compared to heterosexual men. Many researchers have used objectification theory to study eating disorders in both heterosexual women (Aubrey, 2006; Calogero, 2004; Greenleaf, 2005) and heterosexual men (Hallsworth, Wade, & Tiggeman, 2005). In addition, Murnen and Smolak's (1997) meta-analytic study found that gender roles were associated with disordered eating in women. In particular, compared to women without an eating disorder, women with an eating disorder reported higher scores on traditional femininity and lower scores on traditional masculinity.

Few previous studies of disordered eating have explicitly included bisexual participants as well as gay and lesbian participants (e.g., Brewster et al., 2014; Davids & Green, 2011; Feldman & Meyer, 2007). Based on objectification theory, one might expect bisexual individuals to score midway between heterosexuals and gays or lesbians on body satisfaction and disordered eating given that bisexuals may wish to attract members of both the same sex and the other sex. Contrary to this prediction, however, Davids and Green (2011) found that bisexual men in their study reported higher levels of body dissatisfaction compared to heterosexual men (but similar to gay men); they found no differences in body dissatisfaction among bisexual, heterosexual, or lesbian women. With respect to disordered eating, bisexuals (both women and men) had higher levels compared to heterosexuals. Other researchers found a similar pattern with gay and bisexual men differing significantly from heterosexual men in lifetime eating disorders, but with no difference among the women, or between gays and bisexuals regardless of gender (Feldmen & Meyer, 2007).

With respect to health disparities among sexual minority youth, Goffman's (1968) theory of stigma management is useful to understand the role of stigma in negative experiences (e.g., Saewyc, 2011). According to this theory,

individuals employ strategies to avoid or to cope with the stigma associated with their "spoiled reputation" (e.g., being perceived as overweight, being lesbian gay bisexuals). The minority stress model (Meyer & Dean, 1998) adapated parts of the Goffman theory and extended the tenets to sexual orientation; research based on this theory shows that sexual minority youth are more likely than heterosexual youth to engage in a number of risky behaviors (e.g., substance abuse, teen pregnancy, disordered eating) to avoid or to cope with the stigma of being gay, lesbian, or bisexual (e.g., Coker, Austin, & Schuster, 2010; Saewyc, 2011). Perhaps, these experiences of stigma become internalised and lead to negative self-evaluation in the form of body surveillance (especially during adolescence), and ultimately to body dissatisfaction and shame. As a result of these negative evaluations and perceptions, sexual minority youth may consider disordered eating to be a valid coping mechanism.

Current study

Building on the existing research, we examined a geographic location (Minnesota), in order to explore the trends in UWCB among sexually active sexual minority youth identified using a measure of sexual behavior. To better understand how the aforementioned changing social climate may have impacted the lives of sexual minority youth, we sought to address a critical gap in knowledge about UWCB trends and sexual orientation disparities and to provide foundational data for addressing UWCB among youth. We examined three research questions: (1) are there changes over time in trends of UWCB (fasting/skipping meals, using diet pills, and vomiting on purpose to lose weight) for youth, stratified by same-, both-, and opposite-sex sexual behavior; (2) are there disparities in UWCB comparing students reporting same- and both-sex partners to opposite-sex partners; and (3) have sexual orientation disparities in UWCB significantly narrowed, widened, or remained the same across time? In line with the minority stress theory and objectification theory as well as existing empirical data, we hypothesised that the same- and both-sex partnered students would report more UWCB than opposite-sex partnered students, and the sexual orientation disparities would have widened over time.

Method

Data

For this study, we used three waves (1998, 2004, and 2010) of the Minnesota Student Survey (MSS), which is a survey of adolescent health behaviors, related risks, and protective factors. The survey was administered statewide

every three years to middle and high school students in public, charter, and tribal schools in Minnesota (Minnesota Departments of Education, Health, Human Services, & Public Safety, 2010). The majority of school districts participated: participation rates ranged from 88% to 92% across the survey years. In order to participate, the students provided assent, and passive parental consent was used in accordance with the applicable laws. Involvement in the survey was anonymous and voluntary.

Participants

To trace statewide trends in UWCB, we merged three waves of data from the MSS. We pooled responses from a total of 55,597 participants; see Table 1 for breakdown by sex and survey year. On average, the participants were about 17 years old (SD = 1.48) and the sample was split nearly equally between males and females. We included the participants who answered the sexual orientation measure asked in the MSS, which measures sexual behavior. Multiple dimensions (e.g., identity and behavior) can be used to assess sexual orientation in youth; however, given that the sexual identity development is a lifelong process, and the earliest of the trend data is nearly 20 years old—in a time where perhaps not as many young people were reporting sexual minority identities—we utilised the sexual behavior to measure sexual orientation. Only students who reported being sexually active within the past year were included in this analysis—approximately 30% of the total sample (which compares to 30% of past youth 3-month sexual activity reports in national studies; Kann et al., 2016).

Measures

All the items were measured consistently across all survey waves. The participants indicated their sex as male or female.

Sexual Behavior

Two separate questions assessed sexual behavior. We asked participants the following question: "During the last 12 months, with how many different

Table 1. Sample sizes and per cents for the Minnesota Student Survey data, by wave and gender.

	1998	2004	2010
Male			
Opposite-sex partners	7999 (85.8%)	7412 (86.2%)	7832 (80.5%)
Both-sex partners	1176 (12.6%)	1010 (11.8%)	1632 (16.8%)
Same-sex partners	148 (1.6%)	172 (2.0%)	268 (2.8%)
Female			
Opposite-sex partners	8721 (95.5%)	8386 (92.7%)	8869 (90.8%)
Both-sex partners	367 (4.0%)	575 (6.4%)	765 (7.9%)
Same-sex partners	45 (0.5%)	82 (0.9%)	138 (1.4%)

[male/female] partners have you had sexual intercourse?" Response options ranged from one person to six or more persons. We matched this 'sexually active' variable with the sex of the participant to categorise participants into one of three categories: opposite-sex partners, both-sex partners, or same-sex partners. If a participant had sexual intercourse with one or more members of the same sex only, we categorized that participant as same-sex partnered. If a participant had sexual intercourse with one or more members of the same and opposite sex, we considered that participant both-sex partnered.

Unhealthy Weight control Behaviors

Three separate items asked about UWCB: fasting/skipping meals to lose weight, taking diet pills or other drugs to lose weight, and self-induced vomiting to lose weight. Specifically, items asked the following: "During the last 12 months, have you done any of the following to lose weight or control your weight: Fast or skip meals; Use diet pills, speed, or other drugs; Vomit (throw up) on purpose after eating?" Response options were coded as 0 (*no*) or 1 (*yes*). These are the same measures used by the Centers for Disease Control and Prevention in national surveillance of eating behaviors among the U.S. youth (Kann et al., 2016).

Analyses

We used SPSS Complex Samples 22 to perform analyses, which were adjusted for grade in schools. Our preliminary analyses were adjusted for sex, but given that all the differences were significantly different by sex, we disaggregated all analyses by males and females. To address our three research questions, we used crosstab analyses to trace the trends in disordered eating across three waves of data. We were also interested in whether UWCB increased or decreased between waves; to test this, we fit logistic regression models adjusting for grade, comparing trends in each wave to the middle wave (2004). We use 2004 (and not 1998 or 2010) as our reference group because of the V-shaped trends observed in our analyses. For example, many trends increased from 1998 to 2004 and then decreased from 2004 to 2010. Thus, for ease of interpretation, we consistently used 2004 as our reference group. Next, we examined whether there were disparities in UWCB across sexual orientation (measured by behavior). To do this, we reported adjusted odds ratios (AOR) that compared both-sex and same-sex partnered youth to opposite-sex partnered youth on each UWCB outcome at each time point. Last, we identified whether the disparities had widened, narrowed, or remained the same over time. To do this, we included year-by-orientation interaction terms in logistic regression models. To interpret AOR in the models addressing our third research question, the parameter estimates are presented as a ratio of ratios (i.e., an odds ratio for given year of disparity in UWCB was divided by an odds ratio for the reference year). We did this to

determine if the disparity in UWCB had changed over time for a particular subgroup (Homma, Saewyc, & Zumbo, 2016).

Results

Table 1 shows the proportion of each sexual orientation subgroup, disaggregated by sex, in each of the three waves of data. Most sexually active participants indicated opposite-sex partner(s). Males were consistently about twice as likely to report both-sex and same-sex partners compared to their female counterparts in each wave of data.

Table 2 presents the trends in disordered eating from 1998 to 2010 for males and females separately. For opposite-sex partnered males and females, the prevalence of fasting, using diet pills, and vomiting on purpose to lose weight declined over time, but this was not the case for both- and same-sex partnered males and females. Among all behaviors, fasting to lose weight was reported at the highest levels for female participants across all three surveys.

Table 2. Trends in unhealthy weight control behaviors between 1998 and 2010 by gender and sexual orientation.

				1998–2004 (ref)	2004 (ref)–2010
	1998	2004	2010	OR (95% CI)	OR (95% CI)
Fast/skip meals to lose weight					
Male					
Opposite-sex partners	15.9%	17.1%	10.4%	**0.92 (0.84–0.99)**	**0.57 (0.51–0.62)**
Both-sex partners	19.6%	19.6%	12.6%	1.00 (0.81–1.24)	**0.59 (0.47–0.73)**
Same-sex partners	27.7%	25.1%	19.0%	1.11 (0.67–1.83)	0.67 (0.42–1.06)
Female					
Opposite-sex partners	50.4%	48.2%	29.4%	**1.08 (1.02–1.15)**	**0.45 (0.42–0.48)**
Both-sex partners	49.9%	52.0%	36.5%	0.94 (0.72–1.22)	**0.55 (0.44–0.68)**
Same-sex partners	28.3%	52.4%	30.4%	0.35 (0.16–0.77)	**0.41 (0.23–0.72)**
Use diet pills, speed, or other drugs to lose weight					
Male					
Opposite-sex partners	3.3%	4.7%	2.6%	**0.64 (0.52–0.79)**	**0.55 (0.46–0.66)**
Both-sex partners	12.2%	12.7%	7.0%	0.96 (0.75–1.24)	**0.52 (0.40–0.67)**
Same-sex partners	9.5%	8.2%	7.5%	1.15 (0.53–2.48)	0.85 (0.42–1.73)
Female					
Opposite-sex partners	16.8%	12.1%	6.5%	**1.47 (1.43–1.60)**	**0.51 (0.46–0.57)**
Both-sex partners	27.8%	20.7%	13.9%	**1.52 (1.12–2.06)**	**0.64 (0.48–0.85)**
Same-sex partners	8.7%	11.0%	4.3%	0.75 (0.21–2.64)	1.21 (0.46–3.16)
Vomit on purpose after eating to lose weight					
Male					
Opposite-sex partners	1.9%	2.9%	1.7%	**0.72 (0.59–0.89)**	**0.52 (0.31–0.65)**
Both-sex partners	9.8%	11.7%	8.3%	0.88 (0.67–1.14)	**0.57 (0.44–0.75)**
Same-sex partners	6.1%	7.6%	9.0%	0.77 (0.31–1.93)	0.76 (0.35–1.67)
Female					
Opposite-sex partners	12.9%	10.6%	5.8%	**1.23 (1.12–1.35)**	**0.53 (0.47–0.59)**
Both-sex partners	21.5%	24.2%	13.6%	0.91 (0.66–1.25)	**0.53 (0.40–0.70)**
Same-sex partners	13.3%	14.8%	5.1%	1.04 (0.37–3.00)	**0.35 (0.13–0.95)**

Note. Regressions were weighted and adjusted for grade. OR in bold indicates $p < .05$; OR: odds ratio, CI: confidence interval; Ref: Reference Group.

Also in Table 2, we present whether or not these trends changed over time. With some exceptions (e.g., same-sex partnered male youth experienced no declines across all UWCBs; no declines for sexual minorities in fasting and vomiting on purpose to lose weight from 1998 to 2004), there were declining trends in fasting, using diet pills, and vomiting on purpose to lose weight behaviors among study participants. Across all comparisons, opposite-sex partnered youth experienced significant declines in UWCBs

Table 3 presents AORs that describe disparities in fasting, using diet pills, and vomiting on purpose to lose weight by sex and sexual orientation, with opposite-sex partnered youth as the referent group. Of the 36 significant comparisons, sexual-minority youth were more likely to engage in disordered eating in 25 instances and only less likely to engage in one disordered eating behaviors (same-sex females were less likely to fast to lose weight compared to those with only opposite-sex partners in 1998). Especially with respect to vomiting on purpose to lose weight, sexual minorities had up to five times

Table 3. Odds ratios and 95% confidence intervals for unhealthy weight control behaviors by year: Comparisons by gender and sexual orientation.

	1998	2004	2010
Fast/skip meals to lose weight			
Male			
Opposite-sex partners	ref	ref	ref
Both-sex partners	**1.29 (1.10–1.51)**	**1.20 (1.01–1.42)**	**1.23 (1.04–1.44)**
Same-sex partners	**1.99 (1.38–2.88)**	**1.65 (1.15–2.34)**	**1.99 (1.45–2.72)**
Female			
Opposite-sex partners	ref	ref	ref
Both-sex partners	0.89 (0.72–1.10)	1.06 (0.89–1.26)	**1.22 (1.05–1.43)**
Same-sex partners	**0.35 (0.58–0.69)**	1.08 (0.70–1.68)	0.98 (0.68–1.42)
Use diet pills, speed, or other drugs to lose weight			
Male			
Opposite-sex partners	ref	ref	ref
Both-sex partners	**3.92 (3.16–4.87)**	**2.91 (2.35–3.62)**	**2.79 (2.20–3.54)**
Same-sex partners	**3.08 (1.76–5.39)**	**1.85 (1.07–3.21)**	**3.00 (1.87–4.83)**
Female			
Opposite-sex partners	ref	ref	ref
Both-sex partners	**1.77 (1.40–2.24)**	**1.88 (1.51–2.33)**	**2.14 (1.70–2.69)**
Same-sex partners	0.43 (0.15–1.12)	0.88 (0.43–1.33)	0.73 (0.33–1.59)
Vomit on purpose after eating to lose weight			
Male			
Opposite-sex partners	ref	ref	ref
Both-sex partners	**5.46 (4.24–7.05)**	**4.22 (3.33–5.36)**	**5.19 (4.05–6.64)**
Same-sex partners	**3.45 (1.74–6.82)**	**2.58 (1.43–4.64)**	**5.74 (3.65–9.01)**
Female			
Opposite-sex partners	ref	ref	ref
Both-sex partners	**1.58 (1.21–2.05)**	**2.18 (1.77–2.69)**	**4.57 (3.33–6.26)**
Same-sex partners	0.95 (0.41–2.21)	0.88 (0.43–1.77)	0.63 (0.13–3.07)

Note: Data were weighted and adjusted for grade and ethnicity. 95% confidence intervals are in parentheses; odd ratio in bold indicates $p < .05$; ref: reference group (opposite-sex partneres). ref: reference group.

higher odds of vomiting to lose weight than their opposite-sex partnered counterparts.

In Table 4, we reported whether these disparities have remained the same, narrowed, or widened since 1998. We found that the disparities in using diet pills and vomiting on purpose for some groups of sexual minority males have narrowed over time; that is, the disparity in using diet pills for sexual-minority males compared to opposite-sex partnered males narrowed from 1998 to 2004. In addition, the disparity in vomiting to lose weight for sexual-minority males compared to opposite-sex partnered males narrowed from 1998 to 2010. On the contrary, there is one instance where this disparity in a UWCB widened for same-sex partnered females: the disparity in fasting/skipping meals to lose weight widened for same-sex partnered females compared to opposite-sex partnered females from 1998 to 2004.

Discussion

The purpose of this article was to report on trends and sexual orientation disparities in UWCB among sexually active youth. While we found distinct and alarming disparities in UWCB for same- and both-sex partnered youth compared to opposite-sex partnered youth, we also found that two of these disparities were narrowing for males and one had widened for same-sex partnered females.

Table 4. Trends in unhealthy weight control behaviors: Interactions between sexual orientation and year, stratified by gender.

	Male	Female
	OR[a] (95% CI)	OR[a] (95% CI)
Fast/skip meals to lose weight		
Opposite-sex by year 2004	ref	ref
Both-sex by year 1998	1.09 (0.87–1.37)	0.88 (0.67–1.15)
Both-sex by year 2010	1.05 (0.83–1.32)	1.23 (0.98–1.55)
Same-sex by year 1998	1.22 (0.74–2.03)	**0.33 (0.15–0.73)**
Same-sex by year 2010	1.23 (0.77–1.96)	0.96 (0.54–1.70)
Use diet pills, speed or other drugs to lose weight		
Opposite-sex by year 2004	ref	ref
Both-sex by year 1998	**1.40 (1.04–1.90)**	1.03 (0.75–1.41)
Both-sex by year 2010	0.95 (0.69–1.31)	1.25 (0.92–1.69)
Same-sex by year 1998	1.70 (0.78–3.72)	0.53 (0.15–1.88)
Same-sex by year 2010	1.62 (0.78–3.35)	0.76 (0.26–2.26)
Vomit on purpose after eating to lose weight		
Opposite-sex by year 2004	ref	ref
Both-sex by year 1998	1.27 (0.90–1.79)	0.75 (0.54–1.04)
Both-sex by year 2010	1.22 (0.87–1.72)	1.02 (0.75–1.38)
Same-sex by year 1998	1.32 (0.54–3.25)	0.84 (0.30–2.38)
Same-sex by year 2010	**2.21 (1.06–4.64)**	0.64 (0.24–1.74)

Notes: OR in bold indicates $p < .05$; ref: reference group is opposite-sex partnered youth in 2004; models included sexual orientation, grade, survey year, and orientation-by-year interaction; CI: confidence interval.

Our findings of widening disparities among females are consistent with the previous research that has found expanding disparities for sexual minority females; this finding is corroborated by research that has found widening of multiple disparities, such as disordered eating (Watson et al., 2017) and bullying (Goodenow, Watson, Adjei, Homma, & Saewyc, 2016), over time for sexual minority females. Interestingly, we found narrowing disparities for male adolescents, and this is in line with other recent research that finds disordered eating rates are declining for male adolescents (Watson et al., 2017). Despite previous studies focusing on data from different regions of North America where interventions and prevention messaging may be different for females, the results are replicated. It is also noteworthy that despite inconsistency of the measurement of sexual orientation (the current study used sexual behavior, previous studies have used sexual identity, and/or attraction), we found the same negative trends for females.

In general, as predicted by objectification theory (Fredrickson & Roberts, 1997), we found that the prevalance of UWCB to be higher in female youth compared to male youth. In addition, consistent with previous research and as predicted by minority stress (Frost, Lehavot, & Meyer, 2015) and stigma management (Goffman, 1968; Saewyc, 2011) theories, UWCB is more likely in youth reporting same- and both-sex sexual partners compared to youth with opposite-sex sexual partners. Over time, we noticed a reduction generally in UWCB. Furthermore, the pattern of declining trends in UWCB holds for both-sex partnered youth and same-sex partnered youth, yet there are clear disparities between heterosexual and sexual minority young people. In select cases there was a widening sexual orientation disparity in UWCBs. In the case of the same-sex partnered females, as predicted from previous research, the odds of reporting UWCB are lower than for the opposite-sex partnered females. These findings, however, are rarely significant, sometimes due to smaller samples sizes.

A possible explanation for the noticeable change in 2004 might be the legalisation of same-sex marriage across the border in Ontario, Canada in 2003 (Rose, 2012). The province of Ontario was only the third jurisdiction worldwide (after the Netherlands and Belgium) and the first North American jurisdiction to legalise same-sex marriage; Canada legalised same-sex marriage nationwide just two years later in 2005. Although it may be argued that most U.S. youth were unlikely to be aware of the momentous legal change over the border, sexual minority youth may have been paying attention, especially as some U.S. same-sex couples, including celebrity couples, travelled north to Toronto to get married—marriages that were covered in the media (Campbell, 2003; Krauss, 2003). Although we have no data that measures our participants' awareness of or reactions to the societal shift that occurred beginning in 2003, it is possible that such a shift affected the youths' perceptions of sociocultural messages around sexual orientation.

In addition, there may be other explanations for the sexual orientation disparities in UWCB found among young people. First, the existing literature indicates that lesbians are less likely to adhere to the heteronormative and stereotypical female beauty myth of being slim and have more positive body image (Beren, Hayden, Wilfley, & Striegel-Moore, 1997; Bowen, Balsam, Diergaarde, Russo, & Escamilla, 2008; VanKim, Porta, Eisenberg, Neumark-Sztainer, & Laska, 2016). The literature has also shown that lesbians are more likely to be overweight or obese (Bowen, Balsam, & Ender, 2008; Eliason et al., 2015), as well as to smoke and consume alcohol at higher rates than their heterosexual female peers (Rosario et al., 2014). Perhaps, the role of minority stress for lesbians can contribute to the use of coping mechanisms that lead to unhealthy weights (Hatzenbuehler, 2009; Meyer, 2003). Second, perhaps the universal preventive "healthy weight" interventions, related to UWCB, are generally not as effective as the targeted strategies, especially for socially marginalised and disadvantaged groups, such as sexual minority youth. Third, common sociocultural factors, such as peer pressure and media influences, have been found to be associated with UWCB (Field, Camargo, Taylor, Berkey, & Colditz, 1999; Field et al., 2001, 2008; van den Berg, Neumark-Sztainer, Hannan, & Haines, 2007). Though we did not assess peer interaction or support in this study, there may be reason to believe that sexual minority interactions with peers and peer norms may also influence these behaviors.

A number of factors need to be considered in interpretation of findings. First, although sexual behaviors is a salient dimension of sexual orientation development for young people, our sample is limited to only sexually active youth. The social contexts for the sexually active versus not sexually active youth may differ in ways that may confer greater risk for those who are sexually active. For example, peers may influence engagement in both sexual and UWCB (Eisenberg et al., 2012; Sieving, Eisenberg, Pettingell, & Skay, 2006). Relatedly, while our data identified those participants who were sexually active in the past year and who were the focus of this study, we do not know whether or not these results generalise to those who had sexual contact prior to 12 months of survey completion; perhaps this is a unique group and future studies should consider analysing these youth. Scholars should continue to use multiple measures of sexual orientation to best understand how UWCB may differ for this population. Second, we examined trends from 1998 to 2010, representing a 12-year spread. However, there have been major sociocultural and policy changes since 2010 that may influence sexual minority health at state and national levels. More research needs to examine trends over time that capture more recent time periods. Third, we are unable to examine factors that may be responsible for driving these changes in UWCB. Future scholarship should develop new analytic methods to examine how trends in one's behaviors might impact the change

in another. Relatedly, because we utilised multiple waves of cross-sectional data collection in this article, we were not able to make casual inferences and better understand UWCB. Last, we acknowledge that due to smaller sample sizes of sexual minority adolescents in earlier surveys (e.g., 1998), we may have been underpowered to detect significant changes in trends and disparities.

According to Healthy People 2020, additional work is needed to ensure that proper weight and nutritional standards are being met by all youth (Healthy People, 2017). This is clearly a pressing issue for sexual minority youth as well as their heterosexual peers. However, with the gradual societal shifts in the acceptance of sexual minority youth come the potential for positive shifts in individual-, community-, and societal-level distributions of risk and protective factors that influence behaviors such as healthy or unhealthy weight control strategies. Despite these promising shifts, additional research in this area is warranted, particularly in relation to the types of policies and programs available to sexual minority youth to address healthy weight, healthy eating, and related school-based health promotion initiatives. Such research might further examine an interesting finding from this study: Males were twice as likely to report both-sex and same-sex partners compared to their female counterparts. This finding is inconsistent with previous literature, where typically researchers have observed an opposite pattern (Kann et al., 2016).

Implications

By identifying the extent to which UWCB (and related disparities) have widened or narrowed among sexual minority youth and their opposite-sex partnered peers in the United States, we have a clearer understanding that policies and interventions may be needed to promote general healthy weight-related behaviors for sexual minority youth (see Healthy People, 2017). These insights can directly inform the prioritisation and development of tailored health promotion and preventive interventions for the youth most at risk of UWCB.

Documenting potential positive trends in sexual minority youth risk behaviors, or the absence of positive trends, yields important contextualised insights useful not only to stakeholders who serve youth (e.g., health care providers, school staff), but also to policymakers committed to system-level legislation and initiatives (especially those related to UWCB among sexual minorities) that promote equity and acceptance rather than the alternatives. In addition, these disparities highlight the importance of clinicians being trained to recognise signs and symptoms of disordered eating, particularly among sexual minority youth, in order to address the UWCB disparity, particularly the widening disparity among

girls. As a corollary, clinicians need to be able to provide competent care to sexual minority youth in order to improve their health outcomes and address some of the health disparities that disproportionately affect these youth, such as disordered eating.

Clinical significance

- We find that tailored policies and interventions may be needed to promote general healthy weight-related behaviors for sexual minority youth.
- Our findings highlight the need for additional training of clinicians to recognise signs and symptoms of disordered eating, particularly among sexual minority youth.
- Having found that sexual minority females are experiencing widening disparities in unhealthy eating behaviors, clinicians should be aware of the need to address these issues in unique ways among different genders.

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