



Weight Management, Weight Perceptions, and Health-Compromising Behaviours Among Adolescent Girls in the COMPASS Study

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Abstract

Evidence suggests associations between weight management intentions, weight perceptions, and health-compromising behaviours among adolescent girls. Drawing on cross-sectional data for 21,456 girls, we employed multinomial logistic regression to examine whether smoking, binge drinking, and breakfast-skipping were associated with weight management intentions and weight perceptions. According to self-reported heights and weights, 61.4% of girls were in the healthy weight category. However, most reported trying to manage their weight, with 58% trying to lose, 4.5% trying to gain, and 18% trying to maintain their weight. Smokers were more likely than non-smokers to report intentions to lose, gain, or maintain weight versus to do nothing. However, smokers were less likely than non-smokers to perceive themselves as underweight or overweight versus about the right weight. Binge drinkers were more likely than other girls to report an intention to gain and less likely to be trying to maintain their weight versus doing nothing, and breakfast-skippers were more likely to report trying to lose or gain weight but less likely to report trying to maintain weight versus doing nothing. Binge drinkers and breakfast-skippers were more likely than non-binge drinkers and non-breakfast-skippers, respectively, to perceive themselves as underweight, overweight or very overweight versus about the right weight. In sum, the majority of girls reported trying to manage their weight, and those engaging in other health-compromising behaviours were more likely to do so, though the exact nature of the associations differed by behaviour. Recognition of shared underlying risk factors for this clustering of behaviours may inform comprehensive health promotion efforts.

Keywords Weight management · Dieting · Weight perception · Smoking · Binge drinking · Meal-skipping

Introduction

At any given time, one quarter to one half of adolescent girls in North America are trying to maintain their weight or diet in an attempt to lower their weight (Crow, Eisenberg, Story, & Neumark-Sztainer, 2006; Field, Haines, Rosner, & Willett, 2010; Neumark-Sztainer, Wall, Haines, Story, & Eisenberg, 2007). In cross-sectional and longitudinal research, intentions related to weight maintenance and weight loss, subsequently referred to as dieting, have been associated with a wide range of negative health implications, including an increased risk of weight gain and obesity; inadequate intakes of fruits, vegetables and calcium; low self-esteem; disordered eating patterns; and eating disorders in later adolescence and young adulthood (Daee et al., 2002; Field et al., 2003; Neumark-Sztainer, Wall, Story, & Standish, 2012). Among adolescent girls, overweight and obesity or the perception that one is affected by overweight or obesity may increase the risk of inappropriate weight control behaviours (Boutelle, Neumark-Sztainer, Story, & Resnick, 2002). Rates of weight management are high even among girls who fall in the ‘healthy weight’ category according to body mass index (BMI) (Crow et al., 2006; Vander Wal & Thelen, 2000).

In addition to increasing risk for negative consequences such as disordered eating, cross-sectional and longitudinal research suggests that weight maintenance and dieting attempts are associated with other health-compromising behaviours, including smoking, binge drinking, and poor nutrition (Larson, Neumark-Sztainer, & Story, 2009; Pirkle & Richter, 2006; Seo & Jiang, 2009). Existing prospective literature strongly suggests that female adolescent dieters are more likely to engage in smoking than their non-dieting peers, although this literature mostly stems from the 1980s and 90s (Camp, Klesges, & Relyea, 1993; French, Perry, Leon, & Fulkerson, 1994). Among adolescent girls, there is also evidence of a link between weight control and an increased risk of binge drinking years later (Field et al., 2002; Krahn et al., 1996); this is worrisome since binge drinking in adolescence may lead to an increased risk of this behaviour in young adulthood (Krahn et al., 1996). Dieting and weight control behaviours are also strongly associated with eventual increased skipping of meals, with breakfast-skipping the most often studied (Larson et al., 2009; Neumark-Sztainer et al., 2007); the existing evidence suggests that this association is particularly strong among female adolescents affected by overweight and obesity (Boutelle et al., 2002).

In the context of high rates of overweight and obesity (Public Health Agency of Canada, 2011), current public health and health promotion approaches that target youth heavily emphasize weight control, including weight loss and prevention of weight gain (Public Health Agency of Canada, 2012). There has been some concern regarding the potential for such efforts to lead to unhealthy weight control behaviours and perceptions (Bombak, 2014; Roehrig, Thompson, & Cafri, 2008). However, there has been relatively little consideration of how uptake of messages related to weight loss and maintenance might negatively affect engagement in behaviours within other realms, such as tobacco use.

Prior research in this area has predominantly been conducted among American samples or was conducted some time ago (Crow et al., 2006; French et al., 1994; Krahn et al., 1996; Neumark-Sztainer et al., 2007) and may not reflect current associations, given increases in rates of overweight and obesity and potential accompanying shifts in norms related to body weight. Thus, we sought to explore reported weight management intentions and weight perceptions in relation to health-compromising behaviours. Specifically, we investigated whether engaging in smoking, binge drinking, or breakfast-skipping is associated with weight management intentions and weight perceptions.

Methods

We utilized cross-sectional data from the COMPASS Study, hereafter referred to as COMPASS, a prospective cohort study of students in grades 9–12 attending 90 secondary schools in Ontario and Alberta (Leatherdale et al., 2014). Ethics approval was granted by the University of Waterloo Office of Research Ethics. Student information was collected using the COMPASS Student Questionnaire, which queries students' self-reported heights and weights, weight perceptions, and health-related behaviours, including smoking, binge drinking, and breakfast consumption (Leatherdale et al., 2014). We limited the analytic sample to girls, aged 13–18, who completed the Student Questionnaire during the 2013–2014 school year; data from this second year of COMPASS were used to take advantage of a larger sample size due to the recruitment of additional schools subsequent to the first wave of data collection. After accounting for missing data on either of the dependent variables (weight management intentions and weight perceptions), we excluded 693 girls (3.13% of the total sample of girls), resulting in a final analytic sample of 21,456 participants.

Measures

Dependent Variables

To assess intentions related to weight, the survey asked students 'Which of the following are you trying to do about your weight?' and they could indicate whether they were trying to lose, gain, or maintain weight, or were not trying to do anything about their weight. We considered attempting to maintain weight to be conceptually different from not trying to do anything about one's weight; the former implies a concerted intention or effort to manage weight, while the latter does not (McKee, Ntoumanis, & Smith, 2013). Although our interest in terms of the uptake of health promotion messages related to body weight was primarily related to intentions to lose weight, we considered weight control intentions more broadly by also considering girls who reported trying to gain or maintain weight.

We assessed weight perception with the question 'How do you describe your weight?' to which students could respond by identifying as 'very underweight,' 'slightly underweight,' 'about the right weight,' 'slightly overweight,' or 'very

overweight.’ The two underweight categories were collapsed prior to analyses because there were few subjects in each, resulting in four distinct categories. We presumed that participants who perceived themselves as very overweight might also perceive themselves as being affected by obesity.

Preliminary analysis using Spearman’s rank order correlation showed that weight perception and weight management were negatively correlated (suggesting that those tending toward viewing themselves as overweight or very overweight were more likely to report trying to lose weight) and only moderately related ($Rho = -0.44$, $p < 0.0001$). Because we believed that the two measures reflected different constructs, each was analyzed separately as a dependent variable in the regression models described below.

Independent Variables

Consistent with other COMPASS studies (Leatherdale, 2015; Leatherdale & Rynard, 2013), we classified respondents who reported smoking 100 or more cigarettes in their whole life and one or more cigarettes at least one day in the past month as ‘current smokers.’ Respondents who had not smoked 100 cigarettes in their whole life and less than one or more cigarettes at least 1 day in the past month were classified as ‘non-smokers.’ We defined binge drinking as consuming 5 or more drinks on one occasion (Leatherdale, 2015; Leatherdale & Rynard, 2013), although this estimate may be conservative, as the Centers for Disease Control and Prevention defines binge drinking among women as 4 or more drinks per occasion (Centers for Disease Control and Prevention, 2015). We considered respondents who reported engaging in this behaviour at least once a month or daily as ‘current binge drinkers,’ and respondents who reported never consuming 5 or more drinks in one occasion as ‘non-binge drinkers.’ We classified respondents who reported skipping breakfast none or 1 day per week (weekdays and weekends included) in the category of ‘non/minimal breakfast-skipping,’ and those who reported skipping breakfast 2–7 days per week in ‘frequent breakfast-skipping.’

Self-reported height and weight were used to calculate BMI (kg/m^2). We then classified students as underweight, normal weight, or overweight/obese, according to their age and sex as outlined by the International Obesity Task Force (Cole, Bellizzi, Flegal, & Dietz, 2000), or as “BMI missing” since non-response to height and weight measures may indicate a particular pattern of non-response (Arbour-Nicitopoulos, Faulkner, & Leatherdale, 2010). The overweight and obese categories were combined because of a small number of participants in the latter (4.3% of the sample). Self-reported height and weight were previously evaluated in a sample of grade 9 students from Ontario, Canada, with the results suggesting substantial 1-week test–retest reliability and concurrent validity with measured height and weight (Leatherdale & Laxer, 2013).

Additional Covariates

Girls also self-reported their race/ethnicity [White, Black, Asian, Aboriginal (First Nations, Métis, Inuit), Latin American/Hispanic, or Other] and age, which were included as potential confounders.

Statistical Analyses

We used Chi-square tests of significance to analyse associations between the dependent variables and each of the proposed independent variables. We conducted these tests to examine whether each of the proposed health-compromising behaviours was associated with each of the weight-related dependent variables, informing their inclusion in the regression models described below. Correlations between each of the behaviours of interest were small (the highest was between smoking and binge drinking, $r = 0.31$), excluding the likelihood of multicollinearity.

We used multinomial logistic regression modelling to examine associations between smoking, binge drinking and breakfast-skipping, and each of weight management and weight perceptions, while controlling for the possible confounding effects of age and race/ethnicity. These covariates were included because of significant associations observed in the Chi-square analyses. Multinomial regression models are used to observe the association between one or more independent variables and a single dependent variable with more than two levels. We coded not trying to do anything about one's weight ($N = 4253$, 19.2%) and perceiving oneself as about the right weight ($N = 12,250$, 55.3%) as the reference groups in the respective models. These models were repeated with stratification by BMI to examine whether associations between intentions related to weight, weight perceptions, and other health-compromising behaviours differed by weight status. The results of these stratified models, including point estimates and 95% confidence intervals, were observed at face value to determine differences from the overall model results. All analyses were conducted using SAS (version 9.4, SAS Institute, Cary, NC).

Results

The girls in the sample ranged from ages 13–18 (mean = 15.7) years and were mostly White (75.4%).

Prevalence of Intentions Related to Weight, Weight Perceptions, and other Health-Compromising Behaviours in Relation to Weight Status

According to self-reported height and weight, the majority of girls fell into the healthy weight category (61.4%) and approximately 16% were classified as being affected by overweight or obesity (see Table 1). Approximately 21% of participants did not provide height/weight data.

Over half of girls reported trying to lose weight (58.1%), including half of those classified as having a healthy weight according to their self-reported heights and weights, over four-fifths of those classified as being affected by overweight or obesity, and close to two-thirds of those who did not report their height and weight (Table 1).

Over half (56.1%) described themselves as about the right weight, including over two-thirds of the girls in the healthy weight range according to BMI (Table 1). The majority of girls in the 'overweight/obese' category perceived themselves as such (76.5%), and about half of the girls who did not state their weight reported that they were at about the right weight (50.7%). Among those who were classified as underweight, few described themselves as overweight but almost a third stated that they were at about the right weight.

Less than one tenth of the sample identified as current smokers (9.7%), 22% were classified as binge drinkers, and over half of the sample skipped breakfast at least twice a week (Table 1).

Associations Between Weight Management, Weight Perceptions and Other Health-Compromising Behaviours

Table 2 shows the co-occurrence of each behaviour with weight management intentions and weight perceptions. Chi-square analyses indicated significant associations between each of the dependent and independent variables (Table 2).

Results of the multinomial logistic model for weight management intentions are shown in Table 3. Each of the categories indicating an intent to manage weight (lose, gain, and stay the same) were compared to the reference group (not trying to do anything about my weight). Compared to non-smokers, smokers were significantly more likely to report trying to do something versus nothing about their weight (Table 3). Girls who were binge drinkers were also more likely to report trying to gain weight ($OR = 1.56$) and less likely to try to maintain their weight ($OR = 0.59$), but were not more likely to report trying to lose weight ($OR = 1.02$). Finally, girls classified as breakfast-skippers were more likely to report trying to lose ($OR = 1.37$) or gain ($OR = 1.31$) versus doing nothing about their weight.

In the stratified models, the findings persisted across BMI categories, except among girls who reported heights and weights that would designate them as underweight ($N = 307$, 1.39% of sample). These girls were at an elevated risk of engaging in varying forms of weight management if they were binge drinking and breakfast-skipping, but not smoking (data not shown).

The results of the multinomial logistic regression model for weight perceptions are shown in Table 4. Each of the weight perception groups (underweight, overweight, very overweight) was compared to the reference group (about the right weight). Girls who were smokers were significantly less likely to perceive themselves as underweight or overweight versus about the right weight (ORs range from 0.79 to 0.83). Girls who were current binge drinkers or breakfast-skippers (versus those not classified as binge drinkers or breakfast-skippers, respectively) were significantly more likely to perceive themselves as underweight, overweight,

Table 1 Weight management intentions, weight perceptions, and other health-compromising behaviours among Ontario and Alberta adolescent girls, aged 13–18 years, COMPASS 2013–2014 ($N = 22,149$, including all girls in COMPASS wave 2, prior to exclusion of 693 with missing data for weight management and weight perceptions), stratified by BMI category based on self-reported weight and height

Descriptive	% (<i>n</i>)				
	Total sample	Underweight	Healthy weight	Overweight/obese	Not stated
BMI category	100	1.4 (307)	61.4 (13,596)	15.7 (3483)	21.5 (4763)
Which of the following are you trying to do about your weight?					
Lose weight	58.1 (12,716)	17.1 (52)	51.0 (6877)	83.1 (2871)	62.8 (2916)
Gain weight	4.5 (975)	24.9 (76)	4.8 (643)	1.0 (34)	4.8 (222)
Stay the same weight	18.1 (3954)	19.7 (60)	22.9 (3091)	5.7 (198)	13.0 (605)
Not trying to do anything	19.4 (4253)	38.4 (117)	21.3 (2878)	10.2 (354)	19.5 (904)
How do you describe your weight?					
Underweight	10.4 (2270)	63.8 (194)	11.9 (1606)	1.1 (38)	9.4 (432)
About the right weight	56.1 (12,250)	31.9 (97)	67.1 (9056)	22.4 (776)	50.7 (2321)
Overweight	29.0 (6331)	3.0 (9)	19.7 (2663)	60.5 (2092)	34.2 (1567)
Very overweight	4.5 (982)	1.3 (4)	1.3 (168)	16.0 (554)	5.6 (256)
Smoking					
Non-smoker	90.3 (20,010)	90.6 (278)	92.0 (12,509)	86.5 (3014)	88.4 (4209)
Current smoker	9.7 (2139)	9.4 (29)	8.0 (1087)	13.5 (469)	11.6 (554)
Binge drinking					
Non-binge drinker	77.1 (17,236)	79.0 (241)	77.3 (10,476)	79.1 (2752)	79.4 (3767)
Current binge drinker	22.0 (4847)	21.0 (64)	22.7 (3079)	20.9 (729)	20.6 (975)
Skipping breakfast					
No/minimal skipping (0–1/week)	44.3 (9641)	48.5 (147)	47.4 (6367)	39.6 (1360)	38.2 (1767)
Frequent skipping (2–7/week)	55.8 (12,147)	51.5 (156)	52.6 (7055)	60.4 (2072)	61.8 (2864)

or very overweight versus about the right weight. The model stratified by BMI showed similar results (data not shown), suggesting that associations between health-compromising behaviours and weight perception are not mediated by body weight category.

Discussion

This study provides insights into associations between health-compromising behaviours and intentions to control weight and weight perceptions using recent data from a large sample of adolescent girls. Most girls in the COMPASS study reported trying to do something about their weight, with over half trying to lose weight. The proportion intending to lose weight ranged from just under one in five among girls who were categorized as underweight (based on self-reported heights

Table 2 Bivariate associations between weight management intentions and perceptions and other health-compromising behaviours among Ontario and Alberta adolescent girls, aged 13–18 years, COMPASS 2013–2014 (*N* = 21,456)

	Smoking (% , <i>n</i>)		Binge drinking (% , <i>n</i>)		Skipping breakfast (% , <i>n</i>)		<i>p</i>
	Non-smoker	Current smoker	Non-binge drinker	Current binge drinker	No/minimal skipping	Frequent breakfast-skipping	
Weight management intentions							
Loose weight	57.2 (11,315)	66.4 (1401)	55.7 (9486)	66.5 (3199)	52.8 (5050)	62.3 (7494)	< 0.0001
Gain weight	4.1 (816)	7.5 (159)	4.2 (717)	5.3 (254)	4.0 (380)	4.7 (571)	
Stay the same	19.0 (3754)	9.4 (200)	19.2 (3262)	14.2 (681)	21.8 (2082)	15.2 (1826)	
Not trying to do anything	19.7 (3904)	16.5 (349)	20.9 (3562)	14.1 (676)	21.5 (2060)	17.8 (2142)	
Weight perception							
Underweight	10.1 (1998)	12.9 (272)	10.6 (1798)	9.6 (461)	9.8 (937)	10.8 (1294)	< 0.0001
About the right weight	57.5 (11,339)	43.2 (911)	56.1 (9522)	56.2 (2697)	62.4 (5950)	51.2 (6145)	
Overweight	28.4 (5603)	34.4 (728)	29.0 (4927)	28.9 (1386)	24.8 (2368)	32.4 (3883)	
Very overweight	4.0 (782)	9.5 (200)	4.3 (726)	5.3 (254)	3.0 (284)	5.6 (676)	

Table 3 Point and odds ratio estimates for weight management intentions and other health-compromising behaviours among Ontario and Alberta adolescent girls, aged 13–18 years, COMPASS 2013–2014 ($N = 21,456$)

Effect	Weight management	Estimate	<i>Pr</i> > Chi Sq	Odds ratio estimate (95% confidence limits)
Smoker versus non-smoker (reference)	Do nothing			1.00
	Lose	0.54	< .0001	1.71 (1.55, 1.89)
	Gain	0.46	<.0001	1.59 (1.32, 1.91)
	Stay the same	0.22	0.0007	1.24 (1.10, 1.41)
Current versus non-binge drinker (reference)	Do nothing			1.00
	Lose	0.02	0.81	1.02 (0.89, 1.16)
	Gain	0.44	0.0001	1.56 (1.24, 1.95)
	Stay the same	- 0.53	< .0001	0.59 (0.49, 0.71)
Frequent breakfast-skipping versus no skipping (reference)	Do nothing			1.00
	Lose	0.31	< .0001	1.37 (1.27, 1.47)
	Gain	0.27	0.0003	1.31 (1.13, 1.52)
	Stay the same	- 0.14	0.0017	0.87 (0.79, 0.95)
Age	Do nothing			1.00
	Lose	0.01	0.39	1.01 (0.98, 1.04)
	Gain	0.04	0.23	1.04 (0.98, 1.10)
	Stay the same	- 0.004	0.80	0.99 (0.96, 1.03)
Ethnicity	Do nothing			1.00
	Lose	0.002	0.84	1.00 (0.98, 1.03)
	Gain	0.14	< .0001	1.16 (1.11, 1.20)
	Stay the same	- 0.05	0.0006	0.95 (0.92, 0.98)

Multinomial logistic regression observing relationship between binge drinking, smoking, and breakfast-skipping and outcome of weight management intentions

and weights) to over 80% among those classified as having overweight or obesity. Given the plethora of negative implications associated with weight control behaviours (Daee et al., 2002; Field et al., 2003; Neumark-Sztainer et al., 2012), the prevalence of intentions to lose weight is worrisome.

Further, our analyses showed that engaging in other health-compromising behaviours, including smoking, binge drinking, and breakfast-skipping, was associated with a likelihood of trying to change or control weight. With the multinomial approach employed here, we considered a range of weight-related intentions and found that in almost all cases, girls engaging in health-compromising behaviours were more likely to report intentions to manage weight in some way (lose, gain or maintain) versus doing nothing about weight. Although some of our results are consistent with previous research associating each of these behaviours with weight management intentions (Crow et al., 2006; Larson et al., 2009; Pirkle & Richter, 2006), others (such as the association between these behaviours and intended weight gain) offer unique insight into the association between weight

Table 4 Point and odds ratio estimates for weight perception and other health-compromising behaviours among Ontario and Alberta adolescent girls, aged 13–18 years, COMPASS 2013–2014 ($N = 21,456$)

Effect	Weight perception	Estimate	$Pr > \text{Chi Sq}$	Odds ratio estimate (95% confidence limits)
Smoker versus non-smoker (reference)	Underweight	- 0.19	<.0001	0.83 (0.76, 0.90)
	About right			1.00
	Overweight	- 0.24	0.0001	0.79 (0.70, 0.89)
	Very overweight	- 0.16	0.07	0.86 (0.72, 1.01)
Current versus non-binge drinker (reference)	Underweight	0.41	< .0001	1.51 (1.35, 1.68)
	About right			1.00
	Overweight	0.56	< .0001	1.75 (1.49, 2.05)
	Very overweight	0.97	< .0001	2.63 (2.17, 3.19)
Frequent breakfast-skipping versus no skipping (reference)	Underweight	0.44	< .0001	1.56 (1.46, 1.66)
	About right			1.00
	Overweight	0.25	< .0001	1.29 (1.17, 1.41)
	Very overweight	0.73	< .0001	2.08 (1.80, 2.40)
Age	Underweight	0.062	< .0001	1.06 (1.04, 1.09)
	About right			1.00
	Overweight	- 0.06	0.0021	0.94 (0.91, 0.98)
	Very overweight	0.01	0.60	1.02 (0.96, 1.07)
Ethnicity	Underweight	0.02	0.04	1.02 (1.01, 1.04)
	About right			1.00
	Overweight	0.06	0.0003	1.06 (1.03, 1.09)
	Very overweight	0.14	< .0001	1.15 (1.11, 1.20)

Multinomial logistic regression observing relationship between binge drinking, smoking, and breakfast-skipping and outcome of weight perception

management and behaviours by going beyond consideration of intention to lose weight only.

Smokers were more likely to report intentions related to each form of weight management as opposed to doing nothing about their weight, which is consistent with previous weight management research (Camp et al., 1993; Seo & Jiang, 2009). A previous study using data from the first wave of COMPASS also found an association between trying to lose weight and smoking (Minaker & Leatherdale, 2016), but did not focus on girls, include other health-compromising behaviours, or consider other intentions related to weight management. In regard to binge drinking, we found that binge drinkers were more likely than non-binge drinkers to try to gain weight, whereas others have found this relationship particularly pertaining to weight loss (Crow et al., 2006; Field et al., 2002). The mechanisms underlying the

relationship between binge drinking and weight are complex, with previous research showing patterns of caloric restriction prior to binge drinking to prevent weight gain (Stewart et al., 2000). Breakfast-skipping has similarly been investigated in association with weight loss intentions (Neumark-Sztainer et al., 2007), but not specifically in regard to adolescent girls striving to gain weight. Longitudinal analyses of COMPASS data have shown prospective relationships between weight loss intentions at baseline and these behaviours at a two-year follow up, but did not consider weight perceptions (Raffoul, Leatherdale, & Kirkpatrick, 2018).

Indeed, research in this field has tended to focus on whether dieting or overweight/obesity clusters with risky behaviours (Boutelle et al., 2002; Crow et al., 2006), without recognizing the role of weight perceptions. In this study, weight perceptions varied in relation to engagement in the risky behaviours considered, insofar as girls engaging in binge drinking and breakfast-skipping, but not smoking, were more likely to consider themselves to fall in categories other than ‘about the right weight’ versus girls not engaging in these behaviours. Similar to previous research, girls who engaged in binge drinking and frequent breakfast-skipping were more likely to perceive themselves as overweight or very overweight when compared to girls who did not engage in these behaviours (Boutelle et al., 2002). However, our results also highlight a unique association between these behaviours and perceiving oneself as underweight that has not been observed in prior research. Weight perception, regardless of its accuracy, has implications for health-related behaviours among adolescents (Sonneville et al., 2016). We found that any alternate weight perception (under, over, or very over) was associated with a greater risk of binge drinking, regardless of BMI categorization; therefore, girls in both the healthy weight and overweight/obese categories were at an elevated risk of engaging in this behaviour. This suggests that binge drinking engagement may be associated with a perception of overweight across girls in the healthy and overweight BMI categories, rather than weight misperception alone, as has been previously suggested (Pasch et al., 2011).

We found fairly good concordance between weight status according to BMI and weight perceptions. However, because we relied on self-reported heights and weights, we are not able to truly assess the extent to which girls’ perceptions aligned with their actual body weight status. Other studies, utilizing measured height and weight data, have shown that adolescent girls, particularly those with heights/weights corresponding to overweight and obese categories, often misperceive their weight status (Sarafrazi, Hughes, Borrud, Burt, & Paulose-Ram, 2014). It is possible then in this sample that girls who under-reported their weight may also have perceived themselves as belonging to a lower weight category.

Our study has several limitations. The data were collected using self-report and thus are unlikely to accurately reflect respondents’ true height, weight, and health behaviours. Of particular concern is participants’ reporting of height and weight, which were used to calculate BMI; adolescent females often under-report their weight, which may lead to an under-estimation of BMI status in a sample (Pérez, Gabriel, Nehme, Mandell, & Hoelscher, 2015). This bias may stem from several factors, including social desirability (Sherry, Jefferds, & Grummer-Strawn, 2007). A previous study using COMPASS data has evaluated the reporting of weight status

among subsets of the sample relative to objective measures of height and weight and found that the reported and measured height and weight were not significantly different ($ICC = 0.84$; Leatherdale & Laxer, 2013). Further, the distribution of weight status in our sample is generally consistent with population-level estimates based on objectively-measured weight and height data (Public Health Agency of Canada, 2011). Also, the proportions of girls in this study reporting trying to lose weight and perceiving themselves as overweight are similar to a previous study among a Canadian sample (McVey, Tweed, & Blackmore, 2004). Of concern, however, is that in our study, a subset of the sample (21.5%) did not report their height and/or weight. Although these participants did not significantly differ from the others in negative health behaviour reporting or weight control/weight perception, their hesitancy to self-report weight may reflect inaccuracies in their reporting of other behaviours and may stem from a unique profile of non-respondents (Arbour-Nicitopoulos et al., 2010). As a result, we included them in the analyses and did not use missing data strategies or measures to account for their non-response. The small number of girls who self-reported heights and weights corresponding with the obese category (4.3%), and our subsequent collapsing of this category with the overweight classification, limited our ability to analyse these BMI categories separately.

Additionally, the use of single questions to assess what girls are trying to do about their weight as well as their weight perceptions poses a barrier to capturing the complexity of these two constructs and may have led to misclassification. As noted above, there was fairly good but not perfect agreement between weight category based on BMI and weight perceptions, but since both were self-reported, we cannot rule out correlated measurement error. Furthermore, the sample of youth in this study was predominantly White (75%), and the results thus may not be reflective of the experiences of female adolescents who belong to other racial/ethnic groups and may self-report weight control patterns and weight status differently (Croll, Neumark-Sztainer, Story, & Ireland, 2002). In addition, school-level identifiers that account for the clustering of students within schools were not included due to a failure of the multinomial models to converge; this may have resulted in standard error estimates that are too small, inflating estimates of statistical significance (Lohr, 1999). Finally, the analyses reported here were conducted using cross-sectional data.

Longitudinal analyses are needed to further investigate the role of weight management intentions and perceptions in influencing uptake of health-compromising behaviours in adolescent girls, and to establish the directionality of these relationships and factors that might mediate them. Research is also needed to more deeply understand the potential complexity of such relationships, hinted at in this study, in that engaging in different risky behaviours was associated with weight management intentions broadly, not only efforts to lose weight. Such research would enable us to more fully appreciate the array of factors at play and to conceptualize how approaches to address body weight that promote weight control influence youth health holistically, lending to the adoption of a systems approach. Systems approaches, which can facilitate a recognition of the independence and interdependence of risk factors (Diez Roux, 2011; Johnston, Matteson, & Finegood,

2014) and the complex relationships among behaviours, may assist researchers in identifying strategies that promote healthy body weights but also minimize potential unintended consequences related to other health-compromising behaviours (McKee et al., 2013). Beyond the behaviours considered here, the use of a systems lens would enable the consideration of broader societal factors, such as school-level policies and media influences, that may contribute to this complex web of behaviours.

In sum, we found that, even among girls who report weights and heights consistent with a healthy weight range, a considerable proportion report intentions related to weight control. The associations observed with other risky behaviours, as well as worrisome implications of weight management attempts documented in the literature (Daee et al., 2002; Field et al., 2003; Neumark-Sztainer et al., 2012), suggest that body weight should be addressed via comprehensive policies and interventions that consider the array of relevant factors (Johnston et al., 2014).

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Compliance With Ethical Standards

Conflict of Interest The authors declare they have no conflicts of interest.

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