RESEARCH
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Weight Management Efforts, But Not Weight Perceptions, Are Associated with Dietary Quality among Youth and Young Adults in Canada

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ABSTRACT

Background Efforts to lose, gain, or maintain weight are prevalent among youth and young adults, but little is known about the relationship between weight management efforts and dietary quality. Attempts to manage weight are typically driven by weight perceptions, which may also uniquely affect overall diet.

Objective The objective was to explore sex-stratified associations between weight management efforts and perceptions with dietary quality among youth and young adults.

Design Cross-sectional online survey data were drawn from Wave 1 (2016) of the Canada Food Study.

Participants/setting Youth and young adults (n = 3,000), aged 16 to 30 years, were recruited from community settings in five Canadian cities and completed the online survey. The analytic sample consisted of 2,040 participants.

Main outcome measures The Healthy Eating Index-2015 (HEI-2015) was used to characterize dietary quality among participants who completed a 24-hour recall. Respondents reported their weight change efforts over the past year and their weight perception.

Statistical analyses performed Sex-stratified multiple linear regression analyses were conducted to investigate relationships between each of weight management efforts and perceptions, separately, and dietary quality, controlling for known covariates.

Results The HEI-2015 mean score was 52 of 100 possible points. Nearly one quarter of male and female respondents reported not trying to do anything about their weight, whereas 16% reported trying to maintain, 28% and 5% trying to gain, and 33% and 55% trying to lose weight, respectively. Most respondents (63% of males and 66% of females) perceived their weight as just about right. Among males, trying to gain or maintain weight were each significantly associated with higher HEI-2015 mean scores compared with not trying to manage weight ($P < .01$ and $<.001$, respectively), whereas this relationship existed only for weight maintenance among female respondents ($P < .01$). Weight perceptions and HEI-2015 mean scores were not significantly related.

Conclusions Efforts to manage weight, which are commonplace among youth and young adults, are associated with dietary quality. Future behavioral research may provide insights into strategies used by youth to manage weight, guiding interventions that recognize links among weight-related behaviors, dietary quality, and other determinants of health.
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ATTEMPTS TO MANAGE WEIGHT (I.E., TRYING TO lose, gain, or maintain weight) are increasingly common among youth and young adults,[1] and some weight management behaviors may be associated with a range of negative health consequences, including increased risk of eating disorders, mental distress, eventual weight gain and weight cycling, and engagement in harmful health-related behaviors.[2-4] Weight management efforts are prevalent across the weight spectrum,[5] and evidence suggests that weight perceptions, rather than actual body weight, are more relevant to both the extent and healthfulness of weight management engagement.[6,7] For instance, research has shown that regardless of objective weight status, adolescents who perceive themselves as overweight are more likely to try to lose weight than those who do not, and that engagement in *unhealthful* weight loss behaviors is more pronounced in lower-weight adolescents with overweight perception than those with a higher weight status.[8]

Although many deleterious effects of weight management efforts and perception among youth and young adults have

been noted,[2-4] little evidence is available on associations between weight management efforts and perceptions and diet quality. Poor diet quality is a leading risk factor for morbidity and mortality worldwide.[9] Because youth and young adults often use multiple weight management methods that range in healthfulness or safety,[10,11] there is concern that weight management efforts may worsen diet quality among this population. However, the evidence on associations between weight management efforts and dietary quality or intake is mixed. Some studies have found that weight concerns and self-reported weight management efforts among youth are associated with poor diet quality or lower intakes of fruit, vegetables, and nutrients of concern,[12-17] whereas others have found no differences in indicators of diet quality between youth trying vs. not trying to manage weight.[18-21] Furthermore, the association between weight management efforts and diet quality may differ by sex and the type of weight management in which youth are engaged. For example, intentional weight gain, which is much more common among young men than women,[22,23] may include high intakes of calorie-dense foods.[20] This behavior influences overall diet quality differently than weight loss attempts, which are more common among girls and women.[1,22] Correspondingly, it may be weight perceptions more than weight management efforts that are associated with diet quality. Similar to the literature on weight management, the evidence exploring the association between weight perceptions and diet quality is mixed.[8,14,21,24,25]

Nearly all studies exploring the link between weight management efforts and weight perceptions and indicators of dietary quality have been conducted among youth, with little attention to young adulthood.[8,12,14,15,17-21,24,25-27] Late adolescence and young adulthood are critical transition periods in the development of independence and health-related behaviors,[28,29] including the establishment of dietary patterns.[30,31] Longitudinal research has demonstrated that harmful diet- and weight-related behaviors, as well as eating patterns, can track from adolescence into young adulthood.[32] Furthermore, little research has been conducted to assess the impact of weight gain behaviors or underweight perception on diet quality, despite a recent shift to more muscular body ideals among adolescents and young adults.[33,34] Similar to the previously summarized literature, the findings of the few studies exploring intentional weight gain and dietary quality among youth are mixed.[14,20,21] Thus, the objectives of this study were to examine sex-stratified associations between weight management efforts and weight perceptions, separately, with dietary quality among Canadian youth and young adults.

RESEARCH SNAPSHOT

Research Question: Does youth and young adults' dietary quality, based on the Healthy Eating Index-2015, differ by self-reported weight management efforts or weight perception?

Key Findings: In this cross-sectional analysis of data from 2,040 Canadian youth and young adults aged 16 to 30 years, male respondents who were trying to gain or maintain their weight had significantly higher Healthy Eating Index-2015 mean scores and female respondents who were trying to maintain their weight had higher mean scores compared with those not trying to do anything about their weight. There were no significant associations between weight perceptions and dietary quality among male or female respondents.

METHODS

Data Collection

Cross-sectional survey data were drawn from Wave 1 (2016) of the Canada Food Study, a web-based cohort study conducted annually to monitor eating patterns and trends among youth and young adults, aged 16 to 30 years, in Canada. The study queried a range of food- and nutrition-related attitudes and behaviors and included two 24-hour dietary recalls.[35] Participants were recruited via in-person intercept sampling conducted by research assistants at a variety of community sites (malls, transit hubs, parks, or other shopping district) in five Canadian cities (Edmonton, AB; Halifax, NS; Montreal, QC; Toronto, ON; and Vancouver, BC). Eligibility criteria included residing in one of the five cities; being 16 to 30 years of age (inclusive); having access to the internet and a laptop, desktop computer, or tablet; and not having previously enrolled in the study panel. Between October and December 2016, eligible individuals who provided their e-mail address at initial recruitment and enrolled in the study (n = 6,720) received a $2 CAD ($1.50 USD) cash incentive and were sent a personalized link to complete an online survey, including an online 24-hour dietary recall. Four to ten days later, they were sent a second link to complete another online 24-hour dietary recall and received $20 CAD ($15 USD) for completing the study. Close to half completed or partially completed the main survey (n = 3,234, 48.1%). The Canada Food Study was reviewed by and received ethics clearance from the University of Waterloo Office of Research Ethics (ORE #21631), and all participants provided electronic written consent.

After the exclusion of participants who terminated the survey near the beginning (i.e., after the demographic items) (n = 191) or did not pass the data integrity check (n = 43), which required participants to correctly identify the current month, the final Canada Food Study sample comprised 3,000 respondents. Respondents who did not complete the first 24-hour recall (n = 927) were also excluded. Respondents (n = 33) who indicated "don't know" or refused to answer the weight management efforts (n = 8) or weight perception (n = 28) items were also excluded; some respondents (n = 3) refused to answer both questions. The final analytic sample thus consisted of 2,040 respondents.

Canada Food Study Measures

Weight Management Efforts and Weight Perception. - Weight management efforts were assessed using an item from the 2009–2010 National Health and Nutrition Examination Survey,[36] querying respondents which of the following they were trying to do about their weight: lose weight, gain weight, stay the same weight, not trying to do anything about their weight, "don't know," or refuse to answer. Weight perception was assessed using an item from the Canadian Community Health Survey,[37] which asked

respondents if they considered themselves: overweight, underweight, just about right, "don't know", or refuse to answer.

Diet Quality Assessment. After the completion of the main survey, respondents were asked to complete a 24-hour dietary recall using the 2016 Canadian version of the Automated Self-Administered 24-Hour Dietary Assessment Tool (ASA24).[38] A subset of respondents in the Canada Food Study completed a second 24-hour dietary recall (n = 1,702). Data from the first recall were used in the current analysis. ASA24 was developed by the National Cancer Institute (NCI)[39] and subsequently adapted to the Canadian food supply by Health Canada. ASA24 prompted respondents to report all foods and beverages consumed the previous day (midnight to midnight), using a modified version of the U.S. Department of Agriculture's Automated Multiple-Pass Method[40] (ASA24 also prompts supplement intake, but only foods and beverages were considered in these analyses). Foods and beverages reported by respondents were automatically coded by ASA24 and linked to nutrient composition data based on the Canadian Nutrient File.[41] Data on food groups and other dietary components, such as added sugars, are derived by linkage to the 2015–2016 US Department of Agriculture's Food Patterns Equivalents Database.[42]

The Healthy Eating Index-2015 (HEI-2015)[43] was used to characterize dietary quality. The HEI-2015 assesses alignment of intake with the 2015-2020 Dietary Guidelines for Americans[44] based on 13 components, nine of which assess adequacy (Total Fruits, Whole Fruits, Total Vegetables, Greens and Beans, Whole Grains, Dairy, Total Protein Foods, Seafood and Plant Proteins, Fatty Acids), and four that assess moderation (Refined Grains, Sodium, Added Sugars, Saturated Fats).[43] HEI-2015 scores can range up to 100, in which a higher score is indicative of better alignment with dietary guidance, and thus higher diet quality. Moderation components are reverse scored, so that in all cases a higher score reflects better alignment with guidance. HEI-2015 total and component scores were derived for each respondent, using the simple HEI scoring algorithm available from the National Cancer Institute.[45] The HEI-2015 was used in place of a Canadian diet quality index because there is not yet such an index linked to the current Canada's Food Guide and because the food composition data included in ASA24 output is amenable to the HEI-2015.

Additional Measures. Sex was relevant to the analyses because of demonstrated differences in weight management efforts and weight perception between male and female respondents.[1,5,46] Although the Canada Food Study included a measure of gender,[35] among respondents who both completed ASA24 and responded to the weight management efforts and weight perception measures, very few were nonbinary (i.e., gender queer/gender nonconforming, or a different identity; n = 13, 0.62%) whereas others did not respond to the gender item (n = 7; 0.37%). Furthermore, there was high concordance between sex and gender among the sample included in the analysis, because few respondents identified as trans men (n = 7) or trans women (n = 5). Thus, sex rather than gender was analyzed to maximize analytical power, with nonbinary and transgender participants included.

Additional correlates of interest in examining relationships between weight management, weight perception, and diet quality were identified based on the literature and included age (as a continuous variable), race/ethnicity, and body mass index (BMI).[11,47,48] Respondents self-reported their race/ethnicity from a list of categories, including "other," which were further grouped by the Canada Food Study staff into white, Chinese, South Asian, Black, Indigenous inclusive (includes mixed), and mixed/other, which captures respondents who selected more than one race/ethnicity or did not respond to this item.[35] Body mass index was calculated based on respondents' self-reported heights and weights, and then categorized into the World Health Organization classifications: $<$ 18.5, 18.5-24.9, 25.0-29.9, and $\geq$ 30.[49] Because a number of respondents did not report their height or weight, a missing category was included.

Analyses

All analyses were conducted using SAS Studio (Version 9.04, SAS Institute, Cary, NC).[50] In the Canada Food Study, post-stratification sample weights were constructed based on population estimates from the 2016 Canadian Census by age and sex.[35] These weights were applied to the analyses to align the sample composition with Canadian population proportions.

Descriptive statistics, stratified by sex, were conducted to describe the sample's sociodemographic characteristics and calculate prevalences of weight management efforts and weight perceptions. A Pearson χ^2 test of association was conducted to observe the relationship between weight management efforts and weight perception by sex. Means and standard deviations (SD) of HEI-2015 total and component scores were calculated for the total sample and subgroups (by sex). A weighted two-sample t test (testing the probability that $P < .05$) was conducted to explore differences between male and female respondents' mean total HEI scores and each of the mean component scores. In each of the t tests, the variances between male and female respondents were unequal; thus, the Satterthwaite test was used to assess differences in mean scores between the two groups.[51]

Two multivariate, weighted generalized estimating equations were conducted to explore the association between each of weight management efforts and weight perceptions, separately, with the dependent variable defined as diet quality based on total HEI scores and including the covariates age, race/ethnicity, and BMI. These models generated beta coefficients, which indicate the one-unit degree of change in the outcome variable (i.e., HEI-2015 mean score) when comparing the dependent variable with its reference group (e.g., overweight weight perception vs. just about right). A significance level of $P < .05$ was used for all analyses. The regression models were stratified by sex because of demonstrated differences among these variables by sex or gender in the literature.[1,5,46]

RESULTS

Sample Characteristics

The sample characteristics are detailed in Table 1. The sample was nearly equally split by sex (females, 51.5%) and had a

Table 1. Demographic characteristics of weighted analytic sample, by sex, among youth and young adults in the 2016 Canada Food Study (n = 2,040)[a]

	Male, % (n)	Female, % (n)
Age, years (mean)	23.4	23.5
Sex	48.5 (986)	51.5 (1048)
BMI classification		
< 18.5	6.7 (66)	6.2 (65)
18.5–24.9	56.3 (555)	58.7 (615)
25.0–29.9	22.4 (221)	16.0 (168)
≥ 30	8.7 (87)	8.8 (92)
Missing	6.0 (59)	10.3 (109)
Race/ethnicity		
White only	46.6 (460)	55.1 (578)
Chinese only	10.4 (102)	8.3 (87)
South Asian only	8.1 (80)	5.0 (53)
Black only	4.6 (46)	5.0 (53)
Indigenous inclusive	4.3 (43)	3.6 (38)
Mixed/other/not stated/missing	26.1 (258)	23.0 (241)
Self-reported weight management efforts		
Lose weight	32.8 (324)	54.6 (572)
Gain weight	27.6 (272)	5.2 (55)
Stay the same weight	16.6 (164)	16.2 (170)
Not trying to do anything about weight	23.1 (228)	24.0 (251)
Self-reported weight perception		
Overweight	23.0 (227)	28.9 (302)
Underweight	13.9 (138)	5.0 (53)
Just about right	63.1 (622)	66.1 (693)

[a]Totals may not add up to 2,040 because of sample weights and rounding.

mean age of 23.5 years. Just over half of the total sample reported a race/ethnicity of white only (51%). More than half of respondents reported heights and weights corresponding to a BMI in the 18.5 to 24.9 range, and a greater number of female (10.3%) than male (6%) respondents did not report their height or weight. Nearly two thirds of male and female respondents (63.1% and 66.1%, respectively) perceived their weight as just about right. Approximately 77% of males and 76% of females indicated they were trying to modify their weight (i.e., tried to lose, gain, or stay the same weight vs. do nothing about their weight).

Weight management efforts and weight perceptions were significantly associated among both male ($\chi^2 = 570.1$, $P < .0001$) and female ($\chi^2 = 532.8$, $P < .0001$) respondents (data not shown). Among male respondents who perceived their weight as just about right (63.1%), between one fifth and one quarter were trying to lose (20%), gain (25.9%), or stay the same weight (25.1%) (data not shown). Males who perceived themselves as overweight (23%) overwhelmingly reported trying to lose weight (87.7%). A sizable proportion (44.3%) of female respondents who perceived themselves as just about the right weight (66.1%) reported trying to lose weight, with trying to stay the same weight (22.9%) being the next most prevalent behavior. Similar to male respondents, a large proportion (87.6%) of female respondents who perceived themselves as overweight (28.9%) reported trying to lose weight (data not shown).

Diet Quality Mean Scores among Male and Female Respondents. On average, female respondents had a significantly higher mean total HEI-2015 score (53.4, SD = 13.8) compared with male respondents (51.1, SD = 16) (Table 2). Female respondents also had significantly higher mean component scores than males for Total Vegetables, Greens and Beans, Total Fruits, Whole Fruits, and Seafood and Plant Proteins. Male respondents had significantly higher mean scores for the Dairy, Total Protein Foods, and Added Sugars components compared with females (Table 2).

Relationships between Weight Management Efforts and Weight Perceptions, Separately, with Diet Quality. Adjusting for age, BMI, and race/ethnicity, male respondents who reported trying to gain ($\beta = 3.7$, standard error [SE] = 1.4) or stay the same weight ($\beta = 7.6$, SE = 1.6) had significantly higher HEI-2015 overall mean scores than males who were trying to do nothing about their weight (Table 3). Among female respondents, those who reported trying to stay the same weight had higher HEI-2015 mean scores ($\beta = 3.7$, SE = 1.3) than those who reported trying to do nothing about their weight, adjusting for age, BMI, and race/ethnicity. Across both sexes, there were no differences in diet quality between those trying to lose weight and those reporting doing nothing about their weight. There were no significant differences in HEI-2015 mean scores by weight perceptions among male or female respondents, with adjustment for age, BMI, and race/ethnicity (Table 4).

Across models, female respondents with lower and higher BMI values than the 18.5 to 24.9 BMI range and those with missing BMI information were significantly more likely to have lower HEI-2015 mean scores (Tables 3 and 4). Additionally, female respondents who were non-white (ie, Black only, Chinese only, South Asian only, Mixed) had significantly lower HEI-2015 mean scores compared with white respondents. Among males, there were no significant differences in HEI-2015 mean scores by BMI or race/ethnicity. Higher age was associated with slightly higher diet quality among both males and females.

DISCUSSION

Among males, self-reported efforts to gain or maintain weight were associated with better diet quality compared with doing nothing about weight, but among females, the association with diet quality existed only for weight maintenance compared with doing nothing. Furthermore, for both male and female respondents, weight perceptions were not associated with differing diet quality; however, females' diet

Table 2. HEI-2015 overall and component mean scores, by sex, among youth and young adults in the 2016 Canada Food Study (n = 2,040)

HEI component (/maximum score)	Male, mean (SD)[ab]	Female, mean (SD)	Mean difference (95% CL)[c]	t [d]	Pr > |t|
Total (/100)	51.1 (16.0)	53.4 (13.8)	-2.3 (-3.6, -1.0)	-3.5	0.0005
1. Total vegetables (/5)	3.1 (2.1)	3.5 (1.6)	-0.4 (-0.6, -0.3)	-4.9	<.0001
2. Greens and beans (/5)	1.8 (2.6)	2.1 (2.1)	-0.3 (-0.5, -0.1)	-2.9	0.004
3. Total fruits (/5)	1.5 (2.3)	2.2 (2.0)	-0.7 (-0.9, -0.5)	-7.5	<.0001
4. Whole fruits (/5)	1.3 (2.4)	2.1 (2.1)	-0.8 (-1.0, -0.6)	-8.0	<.0001
5. Whole grains (/10)	3.2 (4.4)	3.3 (3.5)	-0.1 (-0.5, 0.2)	-0.7	0.50
6. Dairy (/10)	5.0 (4.4)	4.7 (3.4)	0.4 (0.0, 0.7)	2.1	0.04
7. Total protein foods (/5)	4.0 (1.8)	3.8 (1.5)	0.3 (0.1, 0.4)	3.5	0.0005
8. Seafood and plant proteins (/5)	1.7 (2.5)	2.2 (2.1)	-0.5 (-0.7, -0.3)	-4.9	<.0001
9. Fatty acids (/10)	5.4 (4.2)	5.6 (3.5)	-0.2 (-0.5, 0.1)	-1.1	0.26
10. Sodium (/10)	3.7 (4.3)	3.8 (3.4)	-0.1 (-0.4, 0.3)	-0.5	0.64
11. Refined grains (/10)	5.6 (4.6)	5.7 (3.6)	-0.1 (-0.5, 0.3)	-0.6	0.58
12. Saturated fats (/10)	6.4 (4.0)	6.4 (3.3)	-0.1 (-0.4, 0.3)	-0.3	0.74
13. Added sugars (/10)	8.4 (3.1)	8.1 (2.6)	0.3 (0.1, 0.6)	2.6	0.01

[a]SD = standard deviation.
[b]Higher HEI-2015 mean and mean component scores indicate higher diet quality.
[c]CL = confidence limits.
[d]Independent, two-sample *t* test.

quality was significantly lower if their BMI was outside the 18.5 to 24.9 range or if they did not identify as white only or Indigenous. The findings of this study contribute to the evidence on the role of weight management efforts and diet quality among youth and young adults, who are in a critical period of transition from adolescence to adulthood, during which lifelong dietary patterns are established.[28,30]

The results demonstrate that male respondents who reported trying to gain weight had HEI-2015 mean scores that were nearly four points higher than those of males who were trying to do nothing about their weight, after controlling for age, BMI, and race/ethnicity. Previous evidence suggests that five- to six-point differences in HEI-2015 mean scores may signify a moderate and meaningful difference.[45] To the authors' knowledge, no prior research suggests that male youth or young adults attempting to gain weight exhibit better diet quality than those not doing anything about their weight. Woodruff et al[20] found that grade 7 boys who were trying to gain weight consumed more grain products, meat and alternatives, "other" foods, and total energy than those who were not trying to gain weight, and a 2019 study by Deierlein et al[14] among US adolescents ages 14 to 18 years found that boys who were trying to gain weight consumed significantly more calories than those trying to maintain their weight or not trying to change their weight. In a 2016 study by Datar and Chung,[21] US adolescents who reported trying to gain weight consumed more soda and "junk foods" but also reported more vigorous exercise than their peers who were not trying to modify their weight. In the current study, male respondents, approximately one fourth of whom were trying to gain weight, compared with just 5% of females, achieved significantly higher Dairy, Total Protein Foods, and Added Sugars mean component scores than female respondents, but lower overall HEI-2015 mean scores (51 vs 53). This may suggest that male respondents in this study consumed more dairy and protein foods as part of their weight gain attempts compared with younger respondents in other studies (who consumed more fast foods, grains, and soda).[20,21]

Datar and Chung[21] also found that both male and female youth who reported weight maintenance consumed less fast food, ate more fruits, and engaged in more physical activity than those who were doing nothing about their weight. In this study, male and female respondents who were trying to maintain their weight had HEI-2015 mean scores that were nearly eight and four points higher, respectively, compared with those who reported doing nothing about their weight in adjusted models. Although no evidence suggests that food-related behaviors adopted for weight maintenance are more healthful than those adopted for weight loss or gain, respondents who are trying to maintain a steady weight may be more conscious of the nutritional quality of foods than those whose goals relate to modification of their appearance.[52]

Interestingly, no significant differences in diet quality were found between male or female respondents who were trying to lose weight and those not trying to modify their weight, which contrasts existing studies in this realm. In a 2008 study among adolescents in Alberta, Canada, Woodruff et al[12] found that both boys and girls who were dieting to lose weight and were weight-concerned had worse diet quality, as characterized by a Canadian version of the HEI 2006, compared with those who were not trying to lose

Table 3. Associations between self-reported *weight management efforts* and diet quality (measured by total HEI-2015 mean scores) and among youth and young adults in Canada, by sex, 2016 (N = 2,040)

	β (95% CI; SE)[a,b,c]	
Parameters	**Males (n = 986)[d]**	**Females (n = 1,048)[d]**
Self-reported weight management efforts		
Lose weight	2.7 (-0.2, 5.6; 1.5)	-0.2 (-2.2, 1.9; 1.0)
Gain weight	3.7 (1.0, 6.5; 1.4)**	1.5 (-2.6, 5.6; 2.1)
Stay the same weight	7.6 (4.5, 10.7; 1.6)***	3.7 (1.1, 6.3; 1.3)**
Do nothing about weight	Reference group	Reference group
Age	0.6 (0.3, 0.8; 0.1)***	0.4 (0.2, 0.5; 0.1)***
BMI		
<18.5	0.9 (-3.1, 5.0; 2.1)	-5.5 (-9.2, -1.8; 1.9)**
18.5–24.9	Reference group	Reference group
25.0–29.9	0.1 (-2.6, 2.8; 1.4)	-2.7 (-5.1, -0.4; 1.2)*
≥ 30	-3.6 (-7.5, 0.2; 2.0)	-3.5 (-6.6, -0.5; 1.5)*
Missing	-3.5 (-7.7, 0.7; 2.1)	-3.4 (-6.2, -0.7; 1.4)*
Race/ethnicity		
Indigenous (inclusive)	-4.1 (-9.1, 0.8; 2.5)	-4.3 (-8.7, 0.2; 2.3)
Black only	0.7 (-4.0, 5.5; 2.4)	-3.9 (-7.7, -0.1; 1.9)*
Chinese only	-3.5 (-6.9, -0.2; 1.7)	-6.2 (-9.2, -3.1; 1.5)***
South Asian only	-2.0 (-5.7, 1.7; 1.9)	-8.1 (-11.9, -4.4; 1.9)***
Mixed/other/not stated/missing	0.5 (-1.9, 2.9; 1.2)	-4.1 (-6.1, -2.1; 1.0)***
White only	Reference group	Reference group

[a]Estimates were derived while controlling for all other parameters in the table.
[b]CI = confidence interval.
[c]SE = standard error.
[d]Sample size is not equal to the total of males and females because of poststratification weights.
*$P < .05$; **$P < 0.01$; ***for $P < 0.001$.

weight. Cross-sectional[17] and longitudinal[13] analyses from Project EAT, a Minnesota-based cohort study of youth and young adults, similarly found that girls who used unhealthy weight control efforts to lose or maintain weight had lower intakes of healthful dietary components, but observed no differences among boys. However, as previously detailed, prior research exploring associations between varying types of weight management, particularly intentional weight loss, and indicators of diet quality are mixed. This may be partially explained by inconsistencies in methods of dietary assessments used across studies exploring this research topic,[53] because some used 24-hour dietary recalls and others used food frequency questionnaires, with the latter shown to be affected by bias to a greater extent than the former.[54] Additionally, youth (and particularly young girls) are more likely to underreport intake if they report trying to lose weight or if they perceive themselves as overweight.[19,53] Much of the reviewed literature in this area has made use of data that are more than a decade old, and in recent years, cultural foci have shifted away from a thin body ideal to one that is more lean and muscular.[33] Therefore, more male and female youth and young adults may be engaging in weight-related behaviors focused on maintaining or gaining weight using strategies that may impact overall eating patterns and dietary quality.

Although weight perception was significantly associated with weight management efforts in the current study, no demonstrated associations were found between weight perceptions and diet quality in male or female respondents. Other studies have similarly found that weight perception alone is not associated with diet quality,[8,14,24] but that weight misperception may actually be a more salient predictor of diet-related behaviors and, subsequently, diet quality.[21,25] Youth who misperceive their weight status as overweight may be more likely to use less healthful measures that could hinder diet quality than those who do not to change their weight.[7,55] Thus, future research among youth and young adults may benefit from an exploration of the relationship between weight misperception, rather than weight perception alone, and diet quality.

In the current analyses, youth and young adults had similar mean diet quality scores compared with previous studies of US young adults. For example, in an analysis of 2011–2012 National Health and Nutrition Examination Survey data by Reedy et al,[56] adults aged 20 to 39 years had a mean HEI-2015 score of 55, compared to 51 and 53

Table 4. Associations between self-reported *weight perception* and diet quality (measured by total HEI-2015 mean scores) and among youth and young adults in Canada, by sex, 2016 (N = 2,040)

	β (95% CI; SE)[a,b,c]	
Parameters	**Males (n = 986)[d]**	**Females (n = 1,048)[d]**
Self-reported weight perception		
Overweight	-1.0 (-3.9, 1.9; 1.5)	-1.8 (-4.0, 0.5; 1.2)
Underweight	-1.23 (-4.4, 1.8; 1.6)	-1.2 (-5.4, 3.1; 2.2)
Just about right	Reference group	Reference group
Age	0.5 (0.3, 0.8; 0.1)***	0.4 (0.2, 0.6; 0.1)***
BMI		
< 18.5	0.9 (-3.4, 5.1; 2.2)	-4.3 (-8.2, -0.4; 2.0)*
18.5—24.9	Reference group	Reference group
25.0—29.9	0.02 (-2.8, 2.8; 1.4)	-2.5 (-5.1, 0.1; 1.3)
≥ 30	-3.7 (-7.9, 0.4; 2.1)	-3.0 (-6.5, 0.4; 1.7)
Missing	-3.8 (-8.1, 0.5; 2.2)	-3.4 (-6.2, -0.7; 1.4)*
Race/ethnicity		
Indigenous	-4.2 (-9.2, 0.8; 2.5)	-4.1 (-8.6, 0.3; 2.3)
Black	1.2 (-3.7, 6.0; 2.5)	-4.0 (-7.8, -0.2; 1.9)*
Chinese	-3.2 (-6.6, 0.2; 1.7)	-6.3 (-9.3, -3.2; 1.6)***
South Asian	-1.7 (-5.4, 2.0; 1.9)	-7.8 (11.5, -4.0; 1.9)***
Mixed/other/not stated/missing	-0.6 (-1.8, 3.0; 1.2)	-4.3 (-6.3, -2.2; 1.0)***
White only	Reference group	Reference group

**$P < .01$;
[a]Estimates were derived while controlling for all other parameters in the table.
[b]CI = confidence interval.
[c]SE = standard error.
[d]Sample size is not equal to the total of males and females because of poststratification weights.
*$P < .05$; ***for $P < .001$.

for males and females, respectively, in this study. Although respondents in the present study did have better mean component scores for Whole Grains, Fatty Acids, and Added Sugars than U.S. young adults, other mean component scores such as Total Protein Foods, Greens and Beans, and Seafood and Plant Proteins were lower[56]; however, this study's sample was also younger, with a mean age of 24 years. Higher age was associated with slightly higher HEI-2015 mean scores among males and females, aligning with other studies that demonstrate slightly higher diet quality as individuals move through their early to mid and then late 20s.[31]

BMI and race/ethnicity were strongly associated with diet quality among female and not male respondents. In the adjusted model exploring weight management efforts and diet quality, female respondents whose BMIs were outside of the 18.5—24.9 range had diet quality mean scores ranging from approximately three to five points lower than those within this BMI range, and those who were non-white had mean scores that were four to eight points lower. These findings may be demonstrative of socioeconomic and size-related inequities that exist among women vs men more broadly. Evidence from the U.S. demonstrates that, compared with women who are white and thin, racial and ethnic minority women with higher body weights face weight-based discrimination and poorer mental health[57] to a greater extent. They also engage in far fewer healthful weight-related behaviours,[58,59] potentially hindering diet quality. Future explorations of factors related to diet quality among adults in Canada may benefit from sex or gender stratifications that consider intersections with body size and race/ethnicity.

The findings of this study carry several caveats. First, the Canada Food Study recruited participants from urban centers in Canada,[35] and the sample is thus not representative of Canadian youth and young adults in smaller cities or rural settings; as such, the generalizability of these findings is limited to a particular subset of youth and young adults. Furthermore, a single dietary recall was used to estimate HEI-2015 mean scores for each individual, likely overlooking day-to-day variation in diet quality.[45,60] A subset of respondents in the Canada Food Study completed a second 24-hour dietary recall (n = 1,702),[35] but methods to use repeat recalls to predict usual HEI mean scores for use in regression modeling have not yet been developed.[45] However, the HEI-2015 has demonstrated predictive validity[56] and adequately captures the complexity of eating patterns overall.[45]

The reporting of weight-related efforts and dietary intake may be influenced by social desirability biases,[61,62] particularly among women[63] and individuals with higher weight perceptions,[64] who are also more likely to engage in weight loss attempts.[5] The potential underestimation of less healthful foods and overestimation of healthful foods may have resulted in inflated HEI-2015 mean scores, especially among women, higher-weight individuals, and those who were trying to lose weight. The tool used to assess dietary intake (ASA24) has been validated among adults aged 20 to 70 years and has been shown to perform well in comparison with measures of true intake.[65] Finally, the current study and analyses were cross-sectional, and as such, the temporality of associations between weight management, weight perception, and diet quality could not be established.

Despite these limitations, this is the first known study to investigate the associations between diet quality with each of weight management efforts and weight perception among youth and young adults in Canada. The findings highlight the varying degrees to which different forms of weight management efforts (eg, trying to gain vs do nothing about one's weight) may influence diet quality and how sex-based differences in weight management engagement may reflect differences in the individual components that contribute to overall dietary quality. This study's use of the HEI-2015 to characterize diet quality allows for further monitoring and comparison with analyses conducted among samples both in Canada and in similar countries and may lay the groundwork for longitudinal analyses that explore temporal, causal associations between weight management and weight loss efforts with diet quality overall. As previously noted, much of the literature in this area has focused solely on adolescents or individuals engaged in intentional weight loss. Despite the abundance of evidence highlighting the harms of some forms of intentional weight management or weight misperception,[2-4] the relationships between each of those constructs with diet quality may differ by the type of weight management in which individuals are engaged.

CONCLUSIONS

The current study highlights the complexity of associations between weight-related constructs and behaviors and the diet quality of youth and young adults. Diet quality was higher among males who were trying to gain or maintain weight vs those who were not trying to manage their weight, whereas this relationship only existed for weight maintenance among female respondents. The results suggest that sex-based differences in weight management efforts and related sociodemographic factors, including race/ethnicity, should be considered in public health messaging and policies that target weight and dietary intake among this subset of the population in an effort to promote health and reduce chronic disease risk.

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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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AUTHOR CONTRIBUTIONS

A. Raffoul and S. I. Kirkpatrick conceived of the study. A. Raffoul led the data analyses in consultation with S. Goodman. A. Raffoul and S. I. Kirkpatrick wrote the first draft with contributions from S. Goodman and D. Hammond. All authors reviewed and commented on subsequent drafts of the manuscript.