

Correlates of Weight-Loss Methods Among Young Adults in Canada

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Objective: The aim of this study was to examine the prevalence of various weight-loss behaviors among young adults in Canada and differences in the use of these methods by demographic characteristics, health literacy, and perceived body size.

Methods: Data from the 2016 wave of the Canada Food Study were used, which collected self-reported information from 3,000 young adults in five cities. Linear regression models were conducted to investigate correlates of the number and type of weight-loss methods used across the following four categories: dietary changes, physical activity, assisted weight-loss methods, and unhealthy behaviors.

Results: In the past 12 months, more than half of respondents reported a weight-loss attempt, and nearly one-fifth engaged in an unhealthy weight-loss method. The risk of engaging in a greater number of weight-loss behaviors across categories was higher for women, nonbinary-gendered individuals, and individuals who perceived themselves as having overweight or obesity. Respondents with lower health literacy engaged in a significantly greater number of unhealthy methods.

Conclusions: Many young adults use healthier weight-loss strategies, but a concerning number use multiple and/or unhealthy weight-loss methods as well. Furthermore, there are subgroup differences in weight-loss method engagement, which holds significance for public health efforts aiming to improve weight-related behaviors.

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Introduction

Weight-loss methods vary in healthfulness, ranging from behaviors that are deemed safe and recommended by medical organizations, such as increased exercise and caloric restriction (1,2), to those that are disordered, including self-induced vomiting, use of laxatives, and smoking cigarettes (3,4). Despite individual-level recommendations to reduce caloric intake and increase physical expenditure (1,5), weight status is also influenced by complex systems that exist at broader societal levels (6).

As a result, attempts to lose weight among populations are temporal and often guided by trends and fad diets that are difficult to sustain (7). Weight-loss attempts, regardless of the method used, may even be associated with eventual weight gain, particularly within the first 3 to 5 years after the initial weight loss (8,9) and especially if attempts begin in childhood and adolescence (10). There is also evidence that engaging in a greater number of weight-loss methods and attempts may decrease the likelihood of weight loss and maintenance within 1- and 2-year periods among individuals with obesity as well as increase risk of weight gain (11). Furthermore,

considering the array of factors that can contribute to food- and weight-related behavior (6), different subpopulations are at differing risks of engaging in these various weight-loss methods.

Women are more likely to engage in all types of weight-loss methods than men (12), and they are especially likely to follow specialized weight-loss programs and engage in unhealthy behaviors, such as use of diet pills and binge eating (13,14). Among transgender youth, there may also be an elevated risk of engaging in unhealthy weight-loss methods (15); however, the use of more healthful weight-loss methods among nonbinary-gendered populations has been understudied.

In the United States, multiple sociodemographic factors, including race and/or ethnicity, socioeconomic status (SES), and nutritional knowledge, impact the potential weight-loss methods individuals use. For example, individuals from racial and ethnic minority groups and lower SES households are more likely to engage in unproven and potentially harmful weight-loss methods, including use of over-the-counter supplements and purging (16,17). These populations also engage in fewer healthful weight-loss behaviors (18), especially compared with

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individuals living in higher SES households who are more likely to use recommended weight-loss and weight-control methods, such as exercising and reducing consumption of sweets (17,19). Higher nutritional knowledge, which is associated with a greater SES, is associated with engagement in more healthful weight-loss methods (20).

Individuals with a BMI in the overweight or obesity categories engage in more weight-loss attempts than individuals in the healthy weight range (3,21). However, Baradel et al. highlighted temporal trends in engagement in weight-loss behaviors among Americans over a 7-year period (22) and found that despite rises in rates of obesity, there were only modest increases in weight-loss attempts; therefore, weight perception may be a more salient predictor of engagement in weight-loss practices, particularly among youth in the healthy weight BMI category (23,24).

Little research has been conducted to assess correlates of the number and quality of weight-loss behaviors among a Canadian sample. Although a recent meta-analysis determined worldwide prevalence of various weight-loss and maintenance methods (3), more evidence is needed to characterize the individuals and groups who are most likely to engage in these varying behaviors and how many weight-loss methods they use. This study examined the prevalence of a variety of weight-loss methods among Canadian youth and young adults as well as the differences in the use of these methods by demographic characteristics, health literacy, and perceived body size.

Methods

Data collection

Data were collected via self-completed Web-based surveys as part of the 2016 Canada Food Study. Respondents were recruited by trained research assistants using in-person intercept sampling. Respondents were recruited in five cities (Edmonton, Alberta; Halifax, Nova Scotia; Montreal, Quebec; Toronto, Ontario; and Vancouver, British Columbia) from a sample of sites stratified by region or neighborhood and site type (mall, transit hub, park, or other shopping district). Respondents were invited to enroll in a participant panel for an online study on food choices and were informed that the study would involve completing two online surveys: one the next day and a second survey in 1 week. Eligible respondents resided in one of the five cities, were 16 to 30 years of age, had access to the internet as well as a laptop, desktop computer, or tablet, and had not previously enrolled in the study panel. Eligible respondents were asked to provide their email address and were sent an invitation with a personalized link to the survey ($n = 6,720$).

Surveys were completed between October and December 2016, took approximately 53 minutes to complete, and were conducted in English or French. Respondents received a \$2 cash incentive upon initial recruitment and \$20 after completing the study ($n = 3,486$, 51.9%). Respondents provided consent before completing the survey. The study was reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE #21631). A full description of the study methods can be found in the technical report (25).

Measures

The 2016 Canada Food Study survey included questions about diet-related behaviors, knowledge, attitudes, and perceptions;

sociodemographic variables (i.e., age, income); and other health-related behaviors (e.g., sleep, smoking).

Sociodemographic characteristics. Respondents self-reported their age, gender identity, and race and/or ethnicity. The measure to assess gender identity aligned with recommendations for assessing sex and gender from the Canadian Institutes of Health Research (26); however, because few respondents self-identified as having a gender identity other than man or woman ($n = 41$, 1.4%), these other identities were collapsed into a single category (“nonbinary/refuse to answer”). Respondents also self-reported their race and/or ethnicity using a Canadian census measure; these categories were collapsed into White only, Chinese only, South Asian only, Black only, Aboriginal inclusive (includes mixed), and mixed/other/not stated/missing.

To assess health literacy, participants completed the Newest Vital Sign assessment (27), in which they were asked to read a nutrition label and answer questions pertaining to that food item. Participants were then categorized as having a “high likelihood of limited literacy (score 0-1),” hereafter referred to as “limited literacy”; “possibility of limited literacy (score 2-3),” referred to as “medium literacy”; or “high likelihood of adequate literacy (score 4-6),” referred to as “adequate literacy.”

Respondents self-reported their height and weight in either kilograms or pounds (subsequently converted to kilograms) and centimeters or feet/inches (converted to centimeters). BMI classifications (underweight, normal weight, overweight, or obesity) were determined according to the World Health Organization categorizations of BMI status (28).

Weight perception was determined using pictorial body figure representations from Collins (29) and a question asking, “Which body is most like your own body?” Female and male respondents could select one of seven body sizes; these images were subsequently categorized similarly to previous research (30) as underweight, normal weight, overweight, obesity, and missing. χ^2 analyses revealed that self-reported BMI status and weight perception were highly correlated ($\chi^2 = 2,198.05$; $P < 0.0001$). Because weight perception may be more closely associated with weight-loss attempts than measured or self-reported BMI (31,32) and a greater proportion of the sample responded to this measure, this variable was used in the linear regression models.

Weight-loss methods. Participants who indicated trying to lose weight during the past 12 months ($n = 1,473$) were asked to select all the methods they had used to try and lose weight. These methods included skipped meals or fasted; ate less food (amount); ate less fat; ate less candy, sugar, or sweets; ate fewer carbohydrates; ate more fruits, vegetables, or salads; switched to foods with lower calories; followed a special diet or weight-loss program, e.g., Atkins or Weight Watchers (these respondents were asked to specify the program); used a liquid diet formula such as SlimFast or OPTIFAST; did a cleanse or detox diet; exercised; drank a lot of water; got help from a health professional; took diet pills prescribed by a doctor; took other pills, medicines, herbs, or supplements not needing a prescription; took laxatives or vomited; started to smoke or began to smoke again; other (these respondents were asked to specify); and none of the above, don’t know, or refuse to answer. Participants who provided open-ended answers to the special diet or weight-loss program and other responses were classified as also engaging in the other methods if deemed appropriate.

Weight-loss methods were further categorized into dietary changes, physical activity, assisted weight-loss methods, and unhealthy behaviors. Within each category, an index variable was calculated by summing the number of behaviors each respondent engaged in. An additional index variable was created to sum each respondent's reported weight-loss methods across categories.

Analyses

After adjusting for data quality concerns (25), including eliminated respondents who did not meet the inclusion criteria or pass the data integrity check, the final analytic sample included data from 3,000 respondents. Poststratification sample weights were constructed based on population estimates for 2016 from the 2011 Census (33). Sample probabilities were created for 30 demographic groups (age by sex) based on weighted National Household Survey proportions and applied to the data set. Estimates reported are weighted unless otherwise specified.

Descriptive statistics were derived for characteristics of the unweighted and weighted samples as well as the primary outcomes. A linear regression model was conducted to examine correlates of the number of behaviors participants reported engaging in overall, among the total sample, using a Poisson distribution to account for the count data. Four additional Poisson regression models were fitted to examine correlates of engaging in behaviors by weight-loss category (dietary changes, physical activity, assisted methods, and unhealthy behaviors). The same covariates were used for all of the following regression models: age, gender, race and/or ethnicity, health literacy score, and perceived body size. We have presented the adjusted odds ratios (AOR) from these models. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, North Carolina).

Results

Sample characteristics

Sample characteristics among the unweighted and weighted samples are shown in Table 1. All subsequent analyses and results were conducted and have been presented among the weighted sample.

TABLE 1 Demographic characteristics of sample, young adults in Canada, 2016 (*N* = 3,000)

	Unweighted sample, % (<i>n</i>)	Weighted sample, % (<i>n</i>)
Age (mean)	21.7	23.3
Gender		
Woman	59.4 (1,782)	48.1 (1,445)
Man	39.2 (1,177)	50.5 (1,515)
Nonbinary/refuse to answer	1.4 (41)	1.4 (40)
Race/ethnicity		
White only	44.5 (1,335)	45.3 (1,360)
Chinese only	8.1 (244)	7.9 (237)
South Asian only	6.4 (191)	6.6 (198)
Black only	5.5 (166)	5.3 (160)
Aboriginal inclusive	4.0 (120)	3.8 (113)
Mixed/other/not stated/missing	31.5 (944)	31.1 (932)
Health literacy score		
Limited literacy (score 0-1)	13.1 (394)	13.1 (394)
Medium literacy (score 2-3)	19.7 (591)	18.3 (549)
Adequate literacy (score 4-6)	59.7 (1,792)	60.9 (1,826)
Missing	7.5 (223)	7.7 (231)
BMI classification		
Underweight	6.9 (206)	5.8 (173)
Normal weight	50.8 (1,524)	50.8 (1,523)
Overweight	15.7 (471)	17.3 (520)
Obesity	7.8 (235)	8.0 (240)
Missing	18.8 (564)	18.1 (544)
Perceived body size		
Underweight	9.6 (288)	9.3 (278)
Normal weight	65.5 (1,964)	65.4 (1,963)
Overweight	16.3 (488)	16.4 (493)
Obesity	4.9 (148)	5.2 (155)
Missing/don't know/refuse to answer	3.7 (112)	3.7 (111)

Data derived from self-completed web-based surveys as part of the 2016 Canada Food Study (25).

As shown in Table 1, just over half of the sample self-identified as men, approximately 45% were White only, and more than 60% had an adequate health literacy score. Approximately half of the sample reported heights and weights corresponding with the normal weight BMI category, and less than one-fifth did not report sufficient information to be categorized. Nearly two-thirds of the sample perceived themselves as having a normal weight, and perceived body size was similar among men and women.

Correlates of weight-loss method engagement overall

As shown in Table 2, just over half (50.6%) of the overall sample reported a weight-loss attempt in the past 12 months. The most commonly used weight-loss methods were exercise (41.1%), drinking a lot of water (36.5%), and eating less candy, sugar, or sweets (33.0%).

Approximately 38% of the total sample and 78% of respondents who tried to lose weight in the past 12 months reported using at least four different weight-loss methods (data not shown).

A Poisson regression was fitted to examine sample characteristics associated with the number of weight-loss methods reported across all categories (Table 3). A greater proportion of women (59.8%) and individuals with a nonbinary gender (51.6%) than men (38.3%; AOR = 1.77 and 1.92) reported a weight-loss attempt. Additionally, a significantly greater number of weight-loss methods were reported by women (AOR = 1.77) and respondents who reported a nonbinary gender (AOR = 1.92) compared with men.

Weight-loss attempts were also more common among individuals who perceived themselves as having overweight (79.2%; AOR = 1.85) and obesity (77.8%; AOR = 1.86) compared with those whose

TABLE 2 Weight-loss methods of weighted sample by gender, and among total sample [% , (n)], young adults in Canada, 2016 (N = 3,000)

	Gender			Total sample
	Men	Women	Nonbinary	
Any weight-loss method	38.3 (580)	59.8 (864)	51.6 (21)	50.6 (1,473)
Mean number of behaviors (SD)	1.9 (3.17)	3.5 (3.02)	3.1 (3.70)	2.7 (3.19)
Dietary changes				
Any dietary change	36.1 (485)	59.2 (854)	48.5 (19)	47.3 (1,421)
Drank a lot of water	25.8 (391)	47.5 (687)	42.5 (17)	36.5 (1,095)
Ate less candy, sugar, or sweets	22.8 (345)	43.7 (631)	32.5 (13)	33.0 (989)
Ate more fruits, vegetables, or salads	19.3 (292)	42.8 (619)	27.5 (11)	30.8 (923)
Ate less food	21.0 (318)	40.3 (583)	27.5 (11)	30.4 (912)
Ate less fat	16.8 (254)	27.8 (402)	25 (10)	22.2 (665)
Ate fewer carbohydrates	15.3 (232)	26.9 (388)	27.5 (11)	21.0 (631)
Switched to foods with lower calories	12.2 (185)	22.4 (323)	17.5 (7)	17.2 (515)
Mean number of behaviors (SD)	1.3 (2.37)	2.5 (2.23)	1.9 (2.36)	1.9 (2.36)
Physical activity				
Exercised	32.0 (485)	50.6 (731)	42.3 (17)	41.1 (1,233)
Mean number of behaviors (SD)	0.3 (0.53)	0.5 (0.45)	0.4 (0.50)	0.4 (0.49)
Assisted weight-loss method				
Any assisted weight-loss method	3.3 (50)	6.8 (99)	4.3 (2)	5.0 (151)
Got help from a health professional	1.5 (23)	3.8 (55)	2.5 (1)	2.6 (79)
Followed a special diet or weight-loss program	1.7 (26)	3.3 (48)	2.5 (1)	2.5 (75)
Took diet pills prescribed by a doctor	0.3 (4)	0.3 (4)	0	0.3 (8)
Mean number of behaviors (SD)	0.03 (0.22)	0.07 (0.25)	0.04 (0.20)	0.05 (0.24)
Unhealthy behaviors				
Any unhealthy behaviors	13.7 (207)	23.8 (343)	30.3 (12)	18.8 (563)
Skipped meals or fasted	10.6 (161)	17.2 (248)	22.5 (9)	14.0 (419)
Did a cleanse or detox diet	1.7 (26)	6.9 (100)	10.0 (4)	4.4 (131)
Took other pills, medicines, herbs, or supplements not needing a prescription	1.8 (27)	4.2 (60)	5.0 (2)	3.0 (89)
Took laxatives or vomited	0.5 (7)	3.3 (47)	7.5 (3)	1.9 (57)
Started to smoke or began to smoke again	2.0 (31)	1.8 (26)	7.5 (3)	1.9 (58)
Used a liquid diet formula	1.0 (15)	1.5 (21)	7.5 (3)	1.3 (39)
Mean number of behaviors (SD)	0.18 (0.56)	0.35 (0.67)	0.63 (1.05)	0.26 (0.64)
Other weight-loss method	1.4 (21)	1.8 (26)	5.0 (2)	1.6 (49)

Data derived from self-completed Web-based surveys as part of the 2016 Canada Food Study (25).

TABLE 3 Adjusted odds ratio estimates for correlates of number of weight-loss methods reported in the past 12 months among young adults in Canada, 2016 (N = 3,000)

Correlate ^b	Adjusted odds ratio (95% CI) ^a				
	All weight-loss methods	Dietary changes	Physical activity methods	Assisted weight-loss methods	Unhealthy weight-loss methods
Age (mean)	0.99 (0.98-1.00)	0.99 (0.98-1.00)	1.00 (0.99-1.01)	1.04 (1.00-1.08)	0.98 (0.96-1.00)
Gender					
Women vs. men	1.77 (1.62-1.93)	1.81 (1.66-1.98)	1.53 (1.40-1.67)	1.93 (1.37-2.72)	1.92 (1.60-2.30)
Nonbinary vs. men	1.92 (1.36-2.71)	1.72 (1.18-2.51)	1.55 (1.07-2.25)	1.45 (0.30-7.06)	3.86 (2.33-6.40)
Nonbinary vs. women	1.08 (0.77-1.52)	0.95 (0.66-1.38)	1.01 (0.70-1.47)	0.75 (0.16-3.61)	2.01 (1.23-3.30)
Perceived body size					
Obesity vs. normal	1.86 (1.60-2.17)	1.81 (1.54-2.12)	1.62 (1.38-1.91)	4.07 (2.57-6.45)	2.16 (1.60-2.90)
Obesity vs. overweight	1.01 (0.86-1.19)	0.96 (0.81-1.13)	0.93 (0.78-1.11)	1.80 (1.09-2.97)	1.23 (0.89-1.70)
Obesity vs. underweight	3.53 (2.76-4.51)	3.81 (2.93-4.95)	3.14 (2.43-4.05)	6.70 (2.72-16.47)	2.35 (1.55-3.56)
Overweight vs. normal	1.85 (1.68-2.04)	1.89 (1.71-2.08)	1.75 (1.58-1.93)	2.26 (1.55-3.29)	1.75 (1.43-2.15)
Overweight vs. underweight	3.50 (2.82-4.34)	3.97 (3.15-5.00)	3.38 (2.71-4.21)	3.71 (1.57-8.78)	1.91 (1.34-2.72)
Underweight vs. normal	0.53 (0.43-0.65)	0.47 (0.38-0.59)	0.52 (0.42-0.64)	0.61 (0.26-1.40)	0.92 (0.66-1.23)
Missing vs. normal	0.45 (0.29-0.70)	0.50 (0.32-0.76)	0.37 (0.24-0.59)	0.80 (0.13-4.96)	0.28 (0.10-0.82)
Missing vs. obesity	0.24 (0.15-0.38)	0.27 (0.18-0.43)	0.23 (0.14-0.37)	0.20 (0.03-1.25)	0.13 (0.04-0.39)
Missing vs. overweight	0.24 (0.16-0.38)	0.26 (0.17-0.41)	0.21 (0.13-0.34)	0.36 (0.06-2.23)	0.16 (0.06-0.47)
Missing vs. underweight	0.86 (0.53-1.37)	1.05 (0.65-1.69)	0.73 (0.44-1.18)	1.32 (0.18-9.55)	0.31 (0.10-0.93)
Health literacy score					
Limited vs. adequate	0.81 (0.70-0.93)	0.78 (0.67-0.90)	0.77 (0.67-0.90)	0.59 (0.32-1.07)	1.28 (1.03-1.65)
Limited vs. medium	0.83 (0.70-0.97)	0.82 (0.69-0.97)	0.84 (0.72-0.99)	0.65 (0.33-1.27)	0.93 (0.70-1.23)
Limited vs. missing	1.29 (0.99-1.68)	1.27 (0.97-1.67)	1.09 (0.84-1.41)	2.67 (0.63-11.33)	1.70 (1.02-2.85)
Medium vs. adequate	0.98 (0.88-1.10)	0.95 (0.85-1.06)	0.92 (0.82-1.03)	0.91 (0.59-1.40)	1.38 (1.12-1.71)
Medium vs. missing	1.56 (1.22-2.00)	1.55 (1.20-2.01)	1.29 (1.01-1.65)	4.12 (1.03-16.59)	1.84 (1.12-3.03)
Missing vs. adequate	0.63 (0.50-0.80)	0.61 (0.48-0.78)	0.71 (0.56-0.89)	0.22 (0.06-0.86)	0.75 (0.46-1.22)
Race/ethnicity					
Aboriginal vs. Black	1.02 (0.77-1.34)	1.04 (0.78-1.39)	1.08 (0.82-1.43)	0.79 (0.30-2.12)	0.89 (0.53-1.47)
Aboriginal vs. Chinese	0.94 (0.72-1.21)	0.87 (0.67-1.14)	0.98 (0.76-1.27)	2.26 (0.70-7.28)	1.23 (0.73-2.06)
Aboriginal vs. Mixed	0.93 (0.74-1.16)	0.90 (0.72-1.14)	1.03 (0.83-1.30)	0.79 (0.35-1.79)	0.98 (0.64-1.50)
Aboriginal vs. South Asian	0.99 (0.76-1.29)	0.97 (0.73-1.28)	0.89 (0.68-1.15)	1.48 (0.50-4.43)	1.36 (0.79-2.35)
Aboriginal vs. White	0.95 (0.77-1.19)	0.93 (0.74-1.17)	1.03 (0.82-1.28)	1.04 (0.47-2.32)	1.01 (0.67-1.54)
Black vs. Chinese	0.92 (0.73-1.16)	0.84 (0.66-1.07)	0.91 (0.71-1.15)	2.85 (0.97-8.41)	1.39 (0.88-2.19)
Black vs. Mixed	0.91 (0.75-1.11)	0.87 (0.71-1.07)	0.96 (0.78-1.17)	1.00 (0.51-1.98)	1.11 (0.78-1.58)
Black vs. South Asian	0.97 (0.76-1.24)	0.93 (0.72-1.20)	0.82 (0.64-1.04)	1.88 (0.70-5.07)	1.54 (0.94-2.52)
Black vs. White	0.94 (0.77-1.14)	0.90 (0.73-1.10)	0.95 (0.78-1.16)	1.31 (0.67-2.57)	1.15 (0.81-1.63)
Chinese vs. Mixed	0.99 (0.84-1.18)	1.04 (0.87-1.23)	1.06 (0.89-1.26)	0.35 (0.14-0.89)	0.80 (0.56-1.15)
Chinese vs. South Asian	1.06 (0.84-1.32)	1.11 (0.88-1.40)	0.90 (0.73-1.13)	0.66 (0.20-2.14)	1.11 (0.67-1.839)
Chinese vs. White	1.02 (0.87-1.20)	1.07 (0.91-1.26)	1.05 (0.89-1.24)	0.46 (0.18-1.15)	0.83 (0.58-1.18)
Mixed vs. South Asian	1.06 (0.88-1.28)	1.07 (0.88-1.30)	0.86 (0.72-1.02)	1.88 (0.82-4.31)	1.39 (0.92-2.09)
Mixed vs. White	1.03 (0.93-1.14)	1.03 (0.93-1.15)	0.99 (0.89-1.10)	1.31 (0.90-1.92)	1.03 (0.84-1.27)
South Asian vs. White	0.97 (0.80-1.16)	0.96 (0.80-1.16)	1.16 (0.97-1.38)	0.70 (0.31-1.59)	0.74 (0.50-1.11)

Bolded values are statistically significant based on confidence intervals (CI).

Data derived from self-completed Web-based surveys as part of the 2016 Canada Food Study (25).

^aLinear Poisson regression predicting odds of engaging in a greater number of weight-loss methods, adjusting for other covariates in the table.

^bReference group is listed second.

perceived body sizes corresponded with a normal BMI or whose self-reported heights and weights corresponded with these categories (76.8% and 80.1%, respectively). Participants who did not report their perceived body size used significantly fewer weight-loss methods than those who did (Table 3).

Significantly fewer weight-loss methods were reported by respondents with limited health literacy compared with those with medium (AOR = 0.83) or adequate literacy (AOR = 0.81; Table 3).

Dietary changes

The most commonly reported weight-loss methods were in the dietary changes category (Table 2). Among the overall sample, the most common self-reported dietary change was drinking more water (36.5%), and the least common was switching to foods with lower calories (17.2%).

Respondents who engaged in a greater number of dietary-change-related weight-loss methods were more likely to be women (AOR = 1.81) or respondents who reported a nonbinary gender (AOR = 1.72), or they were more likely to be those who perceive their weight as overweight (AOR = 1.89) or obesity (AOR = 1.81) rather than normal weight. Participants who did not self-report their perceived body size engaged in significantly fewer dietary change behaviors (Table 3). There were no significant differences in dietary change behaviors by age or race and/or ethnicity; however, individuals with limited health literacy engaged in significantly fewer weight-loss methods than those with medium or adequate literacy (AOR = 0.82 and 0.78, respectively; Table 3). Respondents with missing health literacy scores engaged in fewer dietary change behaviors than those with medium (AOR = 0.65) and adequate (AOR = 0.61) health literacy.

Physical activity

Less than half of the sample reported exercising to lose weight in the past 12 months (41%; Table 2). Respondents who were women or reported a nonbinary gender were significantly more likely to engage in exercise than men (AOR = 1.53 and 1.55, respectively). These odds were also elevated among individuals who perceived themselves as having overweight (AOR = 1.75) or obesity (AOR = 1.62; Table 3) versus normal weight. Respondents who did not report their perceived body size and those with limited health literacy were significantly less likely to exercise than those who did report perceived body size or medium/adequate literacy (Table 3).

Assisted methods

Five percent of the entire sample reported using an assisted weight-loss method in the past 12 months (e.g., got help from a health professional, followed a special diet or weight-loss program, took diet pills prescribed by a doctor), with getting help from a health professional being the most common (2.6%; Table 2). Respondents who reported following a special diet or weight-loss program also identified the specific program in a free text section (data not shown). These programs included branded diets (e.g., Weight Watchers, Atkins), physical activity programs (e.g., Live Lean TV), combination diet/physical activity programs (e.g., Beachbody and 21 Day Fix), smartphone-based applications (e.g., MyFitnessPal, Fitbit), and general dietary patterns (e.g., ketogenic, paleo, vegan).

Older respondents had slightly higher odds of using assisted weight-loss methods (AOR = 1.04) than younger respondents (Table 3). Engagement in this group of weight-loss methods was also significantly more likely among women than men (AOR = 1.93) and individuals who perceived themselves as having obesity versus overweight (AOR = 1.80) or normal weight (AOR = 4.07). Respondents who did not report their health literacy were significantly less likely to engage in these weight-loss methods than those with adequate or medium literacy (Table 3).

Unhealthy behaviors

Nearly one-fifth (18.8%) of the sample reported engaging in at least one unhealthy weight-loss behavior in the past 12 months. The most commonly reported unhealthy weight-loss behavior was skipping meals or fasting to lose weight (14.0%), followed by doing a cleanse or diet (4.4%) and taking pills not needing a prescription (3.0%; Table 2).

As shown in Table 3, the odds of engaging in a greater number of unhealthy weight-loss behaviors was higher among women than men (AOR = 1.92) and higher among respondents with a nonbinary gender compared with men (AOR = 3.86) and women (AOR = 2.01). Furthermore, those who perceived themselves as having overweight (AOR = 1.75) or obesity (AOR = 2.16) versus normal weight also engaged in a greater number of these behaviors. Respondents with limited or medium health literacy also had greater odds of engaging in more unhealthy weight-loss behaviors (Table 3). There were no differences in unhealthy behavior engagement among racial and/or ethnic subgroups.

Discussion

Over half of Canadian young adults attempted to lose weight in the previous 12 months. The two most common behaviors, exercise and drinking more water, correspond with recommended guidelines for weight loss and maintenance (1) and do not pose significant health risks, respectively. To our knowledge, there is no research investigating specific weight-loss methods among this population that has highlighted the general healthfulness of self-reported weight-loss attempts. Most of the reported weight-loss methods were classified as more healthful dietary or physical activity changes, but engagement in these behaviors differed significantly among subgroups.

Although unhealthy weight-loss methods were reported less frequently, nearly one-fifth of the total sample engaged in these methods, with even higher rates among women and individuals who identified with a gender identity that was nonbinary. Meal skipping or fasting, reported by 14% of the sample, has previously been identified as a risk factor for poorer overall diet quality (34) and reflects a recent trend in Canada of intermittent fasting as a tool for fat loss (35). Youth and young adults are particularly susceptible to dietary trends, which may also explain the higher rates of fasting, cleanses, and detoxes (36) and lower prevalence of liquid diet formulas, which have fallen out of vogue. Fortunately, this is in contrast to the higher prevalence of more healthful dietary changes, such as drinking a lot of water (37%) or eating more fruits, vegetables, and salads (31%). However, engagement in even healthier weight-loss methods may also be associated with a risk of weight gain years later among younger populations (10).

A smaller yet also concerning proportion of respondents reported using other nonprescription pills, medicines, herbs, or supplements

to lose weight (3%), which was higher than the less than 1% of participants who were taking diet pills as prescribed by a doctor. Rates of supplement use for weight loss among Canadians are unknown, but these products and their claims for weight loss are often false and misleading, and they are part of an unregulated market that can have potentially harmful consequences for consumers (37). In addition, nearly 2% reported taking laxatives or vomiting to lose weight, which is lower than previous estimates among nonclinical young adult samples (31,38). Laxative use or self-induced vomiting in itself cannot indicate the presence of an eating disorder, but they are hallmark symptoms of eating disorder symptomology and may indicate risk of developing an eating disorder (39).

Lower health literacy was associated with greater use of unhealthy weight-loss methods. Limited health literacy, and nutrition knowledge in particular, is associated with poorer overall diet quality (40) and lower levels of physical activity (20). Limited health literacy in this study was not only associated with an increased risk of engagement in unhealthy weight-loss methods, but also with a significantly lower risk of engaging in healthier methods (e.g., dietary changes), which may be particularly reflective of lower nutrition knowledge. Evidence on the relationship between nutrition knowledge and dietary quality is mixed, but a review by Spronk et al. highlighted a modest positive association between greater knowledge and fruit and vegetable consumption (41). Although there have been recent calls in public health and obesity prevention to shift away from targeting individual-level contributors to weight (6), increasing knowledge at the population level may be a contributing factor to decreasing engagement with unhealthy weight-loss methods in high-risk groups.

The total number of weight-loss methods reported by the average respondent is also concerning. A greater number of weight-loss and control attempts are associated not only with increased weight cycling (11), but also with less-successful weight-loss attempts (42). This study demonstrated subgroup discrepancies in the number of weight-loss methods reported by gender, health literacy, and perceived body size. Compared with men, women and respondents with a nonbinary gender identity had greater odds of engaging in more weight-loss methods overall and in each category. This is consistent with previous literature demonstrating greater weight-loss method usage among women (43) and, perhaps, greater eating and body image disturbances among transgender adults (44). This finding implies that weight-loss method selection as well as self-reported engagement is a highly gendered construct, which may have implications for public health initiatives aiming to promote healthful weight-loss behaviors.

Similar to previous research, we found that as perceived body size increases, so does the number of weight-loss methods reported overall and across categories (21,23). However, the number of weight-loss behaviors was similar among respondents who perceived themselves as having overweight versus obesity. This may be attributed to weight misperception, in which individuals who have heights and weights corresponding with a BMI in the obesity category perceive themselves as having overweight, thereby making the two groups seem more similar (or vice versa). It may also explain why the similarity between the two groups was not sustained in the model examining assisted weight-loss methods, because respondents who have obesity may have greater assistance from other individuals to engage in the methods in this category (i.e., got help from a health professional, took diet pills prescribed by a doctor, followed a special diet or weight-loss program), regardless of their own perceived body size. However, the literature on weight misperception and

engagement in weight-loss methods is mixed (31,32,45), and further studies are needed to disentangle this relationship.

This study had some limitations. The data for this study were collected from participants in urban centers in Canada, which may not be reflective of Canadian young adults who live in smaller cities or rural areas. Although survey weights helped to account for sampling errors for age and gender, the sample composition may not be fully representative of the target population.

The study was unable to assess the effects of education or income on weight-loss behaviors, given that education is highly correlated with age (limited to 16–30 years, in this study) and income is not a reliable correlate of SES among this age group. The inclusion of health literacy and nutrition knowledge serves as a useful proxy; however, future studies should examine tailored measures of SES among this age group in greater depth. In addition, the use of a single group to categorize all participants who did not self-identify as a man or woman limited investigation into how specific gender identities, which are different, may engage in weight-loss methods differently. However, the small number of participants with an “other” identity limited our analyses, and the results do reveal that this heterogeneous group seems to differ from men and women. Finally, respondents could only self-report weight-loss methods if they had indicated trying to lose weight in the past 12 months. This may not be reflective of participants who may be engaging in these behaviors, possibly for the purpose of weight maintenance or preventing weight regain, and did not self-identify as trying to lose weight. The effect of this limitation would underestimate the prevalence of weight-loss methods.

Conclusion

This study is the first to demonstrate differences in healthy and unhealthy weight-loss behavior engagement among subpopulations of Canadian young adults. Overall, the current study highlights that a majority of youth and young adults in Canada try to lose weight within a given year. While many youths reported engaging in recommended weight-loss strategies, almost one-fifth reported an unhealthy weight-loss method in the past year. Population efforts to promote healthy eating and to discourage unhealthy weight-loss methods remain a priority among this age group, and although they may target groups at increased risk for overweight and obesity, such as specific ethnic or income groups, they rarely incorporate strategies to promote more healthful behaviors among individuals with different gender identities or differing weight perceptions. Engagement in weight-loss methods may play a significant role in public health initiatives that strive to encourage engagement in healthier weight-related behaviors. **O**

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