

Prevalence and correlates of weight gain attempts across five countries

Kyle T. Ganson PhD, MSW¹  | Jason M. Nagata MD, MSc²  |
Jason M. Lavender PhD^{3,4,5}  | Rachel F. Rodgers PhD^{6,7}  |
Mitchell L. Cunningham BSc (Hons), MRes⁸  | Stuart B. Murray DClInPsych, PhD⁹  |
David Hammond PhD¹⁰

¹Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Ontario, Canada

²Department of Pediatrics, University of California, San Francisco, San Francisco, California, USA

³Department of Medicine, Uniformed Services University, Bethesda, Maryland, USA

⁴Military Cardiovascular Outcomes Research (MiCOR) Program, Bethesda, Maryland, USA

⁵Metis Foundation, San Antonio, Texas, USA

⁶Department of Applied Psychology, Northeastern University, Boston, Massachusetts, USA

⁷Department of Psychiatric Emergency & Acute Care, Lapeyronie Hospital, Montpellier, France

⁸School of Psychology, The University of Sydney, Sydney, New South Wales, Australia

⁹Department of Psychiatry and the Behavioral Sciences, University of Southern California, Los Angeles, California, USA

¹⁰School of Public Health and Health Systems, University of Waterloo, Waterloo, Ontario, Canada

Correspondence

Kyle T. Ganson, Factor-Inwentash Faculty of Social Work, University of Toronto, 246 Bloor Street W, Toronto, ON M5S 1V4, Canada.
Email: kyle.ganson@utoronto.ca

Funding information

CIHR-PHAC Applied Public Health Chair; Public Health Agency of Canada; Canadian Institutes of Health Research

Action Editor: Ruth Weissman

Abstract

Objective: To determine the prevalence and correlates of weight gain attempts in a pooled sample of adults aged 18 and older from Canada, Australia, the United Kingdom, the United States, and Mexico.

Method: Data collected during 2 years (2018 and 2019) of the International Food Policy Study ($N = 42,108$) were analyzed. Unadjusted 12-month prevalence of weight gain attempts was estimated based on body mass index (BMI; kg/m^2), weight perception, country, survey year, and sex. Logistic regression analyses were estimated to determine the sociodemographic correlates (age, race/ethnicity, education, BMI, weight perception, weight perception accuracy, and self-rated mental health) of weight gain attempts among the pooled sample stratified by sex.

Results: Men (10.4%) were significantly more likely than women (5.4%) to report weight gain attempts ($p < .001$). Nearly one in five (17.1%) men with a BMI in the “normal” range (≥ 18.5 to < 25.0) reported weight gain attempts. Among both men and women, minority group identity was associated with higher odds, while older age and higher BMI category were associated with lower odds, of reporting weight gain attempts. Country differences over the two survey years showed the prevalence of weight gain attempts in 2019 (vs. 2018) was higher among women in Australia ($p < .05$) and men in the United States ($p < .01$).

Discussion: Weight gain attempts are more common among men, compared to women, across five countries, potentially reflecting the global salience of the pursuit of a muscular body.

KEYWORDS

Australia, body ideals, disordered eating, international, men, muscularity, United States, weight gain attempts

Abbreviations: AOR, adjusted odds ratio; BMI, body mass index; CI, confidence interval; IFPS, International Food Policy Study; OR, odds ratio.

The opinions and assertions expressed herein are those of the authors and do not necessarily reflect the official policy or position of the Uniformed Services University or the Department of Defense.

1 | INTRODUCTION

A majority of studies addressing weight change strategies have focused on understanding the nature, prevalence, and outcomes of behaviors intended to *reduce* weight or to *avoid* gaining weight (Ojala et al., 2007; Piernas, Aveyard, & Jebb, 2016; Robinson, Sutin, & Daly, 2018). However, as research has better characterized the modern, socioculturally prescribed male and female body ideals, there has been greater recognition that a substantial proportion of individuals may engage in attempts to *gain* weight. Specifically, the ideal male body in “Westernized” societies is characterized by a highly muscular and lean build (Baghurst, Hollander, Nardella, & Haff, 2006; Murray et al., 2017; Pope, Khalsa, & Bhasin, 2017), while the female body ideal is characterized by toned muscularity and appearing “fit” and slender (Rodgers et al., 2018). These social pressures towards muscularity, particularly for men, may lead individuals across a range of body weights and shapes to engage in weight gain efforts in an attempt to increase muscularity (McCabe, Ricciardelli, & Finemore, 2002; McCreary, Sasse, Saucier, & Dorsch, 2004), as emphasized by sociocultural theories (Ata, Schaefer, & Thompson, 2015; Donovan, Uhlmann, & Loxton, 2020; Tylka, 2011, 2021).

Consistent with this, preliminary research on the prevalence of weight gain attempts indicates that many individuals endorse such efforts, particularly boys and young men. Studies have examined the prevalence of weight gain attempts among men and women from a variety of countries including Canada, the United States, and the United Kingdom. In a Canadian sample, 23% of men and 6% of women aged 17 to 32 years reported weight gain attempts (Minnick, Raffoul, Hammond, & Kirkpatrick, 2020). Similarly, in a sample from the United States, 30% of adolescent boys and 27% of young adult men aged 18 to 26 years, compared to 6% of adolescent girls and 5% of young adult women aged 18 to 26 years, endorsed weight gain attempts (Nagata et al., 2019; Nagata et al., 2020). Reflecting a somewhat lower prevalence in a sample from the United Kingdom, particularly for boys, only 13% of adolescent boys and 4% of adolescent girls reported weight gain attempts (Solmi et al., 2020). This research highlights both the inconsistent prevalence of weight gain attempts across countries in multiple independent studies over the past 20 years, as well as provides evidence that additional contemporary research on weight gain attempts is warranted to better understand this behavior.

Guided by frameworks highlighting the role of pressures related to shape and weight (Ata et al., 2015; Donovan et al., 2020; Tylka, 2011, 2021), prior research has identified several distinct factors related to weight gain attempts. First, consistent with the greater emphasis on lean, bulky muscularity characterizing the male body ideal versus the fit, toned muscularity (with less emphasis on bulk) characterizing the female body ideal, studies have shown that men are more likely than women to endorse efforts to increase weight (Minnick et al., 2020; Nagata, Garber, Tabler, Murray, & Bibbins-Domingo, 2018; Nagata, Murray, et al., 2019; Solmi et al., 2020). Second, evidence suggests that self-perceived body weight may be relevant to weight gain attempts. Specifically, although those who perceive themselves as underweight represent a substantial

proportion of those endorsing efforts to gain weight, many adolescents and young adults who report weight gain attempts have a body mass index (BMI) classified within the “normal” range (Calzo, Corliss, Blood, Field, & Austin, 2013; Minnick et al., 2020; Nagata et al., 2019). Third, research suggests the importance of racial/ethnic identity, with weight gain attempts more prevalent among individuals who identify with non-White minority racial and ethnic groups (Minnick et al., 2020; Nagata et al., 2020; Nagata, Bibbins-Domingo, et al., 2019; Nagata, Murray, et al., 2019). Thus, some groups may be more likely to report weight gain attempts, which is consistent with theories highlighting the role of social identities on weight and appearance modification efforts (Rodgers, Berry, & Franko, 2018).

Although research investigating the prevalence and correlates of weight gain attempts has increased in recent years, several key gaps remain. First, a majority of existing studies have focused solely on adolescents and young adults (McVey, Tweed, & Blackmore, 2005; Minnick et al., 2020; Nagata et al., 2020; Nagata, Murray, et al., 2019; Solmi et al., 2020), with limited data available in middle-aged and older adults. This is especially problematic in light of evidence that body image concerns and related behaviors remain common through adulthood, yet may be somewhat distinct in nature from younger populations (Bennett, Hurd, Pritchard, Colton, & Crocker, 2020; Brown, Forney, Klein, Grillot, & Keel, 2020; Keel, Baxter, Heatherton, & Joiner, 2007; Murray, Brown, Lavender, Nagata, & Keel, 2020). Therefore, additional research is needed to characterize weight gain attempts among a broader sample of adults. Second, while research on weight gain attempts has occurred in multiple countries, few studies to date have investigated the prevalence of weight gain attempts internationally in a unified study. This allows for meaningful comparison between countries to occur, which is difficult using multiple independent studies. Third, while prior research has investigated weight misperception and eating disorder symptoms, particularly among young people and those with higher weight (Hazzard, Hahn, & Sonnevile, 2017; Rancourt, Thurston, Sonnevile, Milliren, & Richmond, 2017; Sonnevile, Thurston, Milliren, Gooding, & Richmond, 2016), no known studies have investigated whether weight misperception is associated with weight gain attempts.

Given the limitations of the existing literature, the aim of this study was to examine the prevalence and correlates of weight gain attempts across four high-income countries (Canada, Australia, the United Kingdom, and the United States) and one middle-income country (Mexico) across 2 years. Consistent with research previously described, it was expected that across all samples, (a) men would be more likely to endorse weight gain attempts than women, and (b) those from a minority racial/ethnic identity would be more likely to endorse weight gain attempts than those from a majority identity. No other a priori hypotheses were specified.

2 | METHODS

Data from two survey years (2018 and 2019) of the International Food Policy Study (IFPS) were analyzed. IFPS is an annual repeat

cross-sectional survey conducted in Australia, Canada, Mexico, the United Kingdom, and the United States. Participants were recruited via Nielsen Consumer Insights Global Panel and their partners' panels. Email invitations with unique survey links were sent to a random sample of panelists within each country after targeting demographic groups. Data were collected via web-based surveys conducted in November–December in both 2018 and 2019 with adults aged 18 years and older. Potential respondents were screened for eligibility and age and sex quota requirements. Respondents provided informed consent and received remuneration in accordance with their panel's typical incentive structure (e.g., points-based or monetary rewards, chances to win prizes). Surveys were conducted in English in Australia and the United Kingdom; Spanish in Mexico; English or French in Canada; and English or Spanish in the United States. Members of the research team who were native in each language independently reviewed the French and Spanish translations. The study received ethics clearance through the University of Waterloo Research Ethics Committee (ORE# 30829). A full description of the study methods and further description of the sample participants, by country and key sociodemographic characteristics, can be found elsewhere (International Food Policy Study, 2021a, 2021b).

A total of 28,684 participants completed the 2018 survey and 29,290 participants completed the 2019 survey. Respondents were excluded for the following reasons: region was missing, ineligible or had an inadequate sample size (i.e., Canadian territories); invalid response to a data quality question; survey completion time under 15 min; and/or invalid responses to at least three of 20 open-ended measures (2018: $n = 5,860$; 2019: $n = 8,322$). The final samples for the 2018 and 2019 survey years were 22,824 and 20,968, respectively. Analyses in the current study excluded 1,684 participants who were surveyed both years, resulting in a final total sample of 42,108 unique participants that were analyzed.

3 | MEASURES

3.1 | Dependent variable

Weight gain attempts were assessed using the question, “During the past 12 months have you tried to ... gain weight.” Other responses assessing alternative weight goals included, “lose weight;” “stay the same weight;” “I have not tried to do anything about my weight;” and “don't know.” This measure aligns with prior research investigating weight gain attempts (Minnick et al., 2020; Nagata, Bibbins-Domingo, et al., 2019; Solmi et al., 2020).

3.2 | Independent variables

3.2.1 | Sociodemographic variables

Age, sex, race/ethnicity, and education were based on self-report. Sex was assessed using the question, “What sex were you assigned at

birth, meaning on your original birth certificate?” Response options included “male” and “female.” Race/ethnicity was categorized into “majority,” “minority,” and “not stated” groups as per census questions asked in each country. Education was categorized as “low,” “medium,” or “high” according to country-specific criteria of the highest level of formal education attained. These categorizations of race/ethnicity and education are consistent with prior IFPS research (Forde et al., 2019; Kwon et al., 2019; Vanderlee et al., 2021).

3.2.2 | BMI

BMI was calculated using self-reported height and weight measurements according to each country's measurement unit (e.g., pounds, feet, and inches; kg/m^2). BMI was categorized into four classes: ≤ 18.49 (“underweight”); ≥ 18.50 to ≤ 24.99 ; (“normal weight”); ≥ 25.00 to ≤ 29.99 (“overweight”); and ≥ 30.00 (“obese”) based on Centers for Disease Control and Prevention guidelines (Centers for Disease Control and Prevention, 2020). BMI categories were included in the current manuscript for the purpose of comparison with existing literature, and are not considered an intrinsically useful taxonomy by the authors.

3.2.3 | Weight perception

Weight perception was assessed using the question, “Do you consider yourself to be ... Obese; Overweight; Underweight; Just about right; Don't know.”

3.2.4 | Weight perception accuracy

Weight perception accuracy was created based on BMI category and weight perception. Three categories were created: accurate weight perception included those whose BMI category and weight perception align; under perceive weight included those whose BMI category is higher than their weight perception; over perceive weight included those whose BMI category is lower than their weight perception. Those who reported “don't know” ($n = 325$) for weight perception were excluded for this variable.

3.2.5 | Self-rated mental health

Self-rated mental health was assessed using the question, “In general, would you say your mental health is ... Poor; Fair; Good; Very good; Excellent; Don't know.”

3.3 | Statistical analysis

Descriptive statistics were calculated to provide an overview of the sample characteristics. Chi-square tests were used to examine sex

TABLE 1 Characteristics of men and women from the 2018 and 2019 International Food Policy Study (N = 42,108)

	Men n = 20,641	Women n = 21,467	p	NNT
	M (SD)/n (%)	M (SD)/n (%)		
Age			<.001	
18–29 years	4,224 (23.9)	4,977 (22.1)		55
30–44 years	5,565 (27.0)	5,936 (26.5)		200
45–59 years	5,021 (25.2)	5,192 (26.2)		100
≥60 years	5,831 (23.9)	5,362 (25.3)		71
Race/ethnicity ^a			.374	
Majority group	16,855 (77.8)	17,559 (79.3)		67
Minority group	3,557 (21.0)	3,642 (19.5)		67
Not stated	229 (2.2)	266 (1.2)		100
Education ^b			<.001	
Low	5,361 (40.9)	6,514 (45.1)		24
Medium	5,317 (21.4)	6,043 (22.2)		125
High	9,893 (37.3)	8,837 (32.4)		20
Not stated	70 (0.4)	73 (0.4)		0
BMI category (kg/m ²)			<.001	
<18.5 (“underweight”)	382 (2.2)	776 (3.7)		67
≥18.5 to <25.0 (“normal weight”)	6,640 (31.9)	8,020 (35.8)		26
≥25.0 to <30.0 (“overweight”)	7,127 (33.0)	4,936 (23.1)		10
≥30.0 (“obese”)	6,492 (32.9)	7,735 (37.4)		22
Weight perception			<.001	
Underweight	1,592 (8.6)	1,162 (5.8)		36
Just about right	9,127 (44.5)	8,535 (38.7)		17
Overweight	8,598 (40.3)	9,458 (45.1)		21
Obese	1,154 (5.8)	2,045 (9.5)		27
Don't know	140 (0.8)	185 (0.9)		1,000
Weight perception accuracy ^c			<.001	
Accurate perception	10,290 (48.0)	12,017 (54.4)		16
Under perceive weight	9,200 (46.1)	7,227 (35.3)		9
Over perceive weight	1,151 (5.9)	2,223 (10.3)		23
Weight change attempts, past 12 months ^d				
Gain weight	1,900 (10.4)	1,082 (5.4)	<.001	20
Lose weight	7,994 (37.3)	11,139 (51.3)	<.001	7
Stay the same weight	5,567 (25.9)	4,565 (20.8)	<.001	20
Did not try to change weight	5,827 (29.1)	5,264 (24.9)	<.001	24
Self-rated mental health			<.001	
Poor	995 (6.0)	1,512 (7.4)		71
Fair	2,693 (14.2)	3,713 (17.5)		30
Good	6,278 (30.5)	7,173 (33.4)		34
Very good	6,215 (29.1)	5,768 (26.6)		40
Excellent	4,205 (18.9)	3,101 (14.3)		22
Don't know	201 (1.2)	161 (0.8)		250
Country			<.001	
Canada	4,053 (20.1)	4,264 (19.3)		125
Australia	3,721 (18.5)	3,877 (17.8)		143

TABLE 1 (Continued)

	Men <i>n</i> = 20,641	Women <i>n</i> = 21,467	<i>p</i>	NNT
	M (SD)/ <i>n</i> (%)	M (SD)/ <i>n</i> (%)		
United Kingdom	4,521 (22.0)	4,746 (22.0)		0
United States	4,039 (20.1)	4,538 (20.6)		200
Mexico	4,307 (19.3)	4,042 (20.3)		100

Note: Frequencies represent observed counts which may not directly match weighted percentages. Percentages are weighted using sample weights. Abbreviations: BMI, body mass index; M, mean; NNT, number needed to treat; SD, Standard deviation.

^aRace/ethnicity categories in each country as per census questions asked in each country: Australia: majority = only speaks English at home, minority = speaks a language besides English at home; Canada: majority = “White (European descent),” minority = any other race/ethnicity; Mexico: majority = nonindigenous, minority = indigenous; United Kingdom: majority = “White,” minority = any other race/ethnicity; United States: majority = “White,” minority = any other race/ethnicity.

^bEducation was categorized as “low” (i.e., completed secondary school or less), “medium” (i.e., some postsecondary qualifications), or “high” (i.e., university degree or higher) according to country-specific criteria of the highest level of formal education attained.

^cWeight perception accuracy: accurate weight perception included those whose BMI category and weight perception align; under perceive weight included those whose BMI category is higher than their weight perception; over perceive weight included those whose BMI category is lower than their weight perception. Those who reported “don't know” (*n* = 325) for weight perception were excluded.

^dParticipants were asked to “check all that apply,” resulting in categories that were not mutually exclusive.

differences. Unadjusted prevalence of weight gain attempts was estimated by sex and BMI category, sex and weight perception, and sex, country, and survey year with differences examined using chi-square tests. Number needed to treat (NNT) was calculated to determine effect size for chi-square tests. Generally, a smaller NNT represents a stronger effect (Kraemer & Kupfer, 2006). Two logistic regression analyses were conducted and odds ratios (OR) with corresponding 95% confidence intervals (CI) were used to examine the associations of age, race/ethnicity, education, BMI category, weight perception, self-rated mental health, and survey year (independent variables) with weight gain attempts (dependent variable) among men and women. We tested for effect modification/interactions for country and all variables under study and found no statistically significant effects (*p*'s > .05). We conducted one additional logistic regression analyses including country as an independent variable, alternating between each country as the reference group. The results for Mexico as the reference group among men are displayed as it was the only analysis that provided statistically significant results. Two logistic regression analyses were conducted and OR with corresponding 95% CI were used to examine the associations of weight perception accuracy (independent variable) and weight gain attempts (dependent variable) among men and women, while adjusting for age, race/ethnicity, education, self-rated mental health, and survey year. Given prior research (Calzo et al., 2013; Minnick et al., 2020; Nagata, Bibbins-Domingo, et al., 2019; Solmi et al., 2020) and the significant sex differences identified in this study, all analyses were stratified by sex. All analyses included post-stratification sample weight constructed using a raking algorithm with population estimates from the census in each country based on age group, sex, region, ethnicity (except in Canada), and education (except in Mexico). Therefore, percentages reported are inclusive of sample weights and may not correspond with observed *n*'s. Analyses were conducted in 2021 using Stata 16.1.

4 | RESULTS

Sample characteristics are displayed in Table 1. Overall, 10.4% of men endorsed weight gain attempts in the past 12 months, compared to 5.4% of women (*p* < .001).

Among both men (42.7%) and women (33.4%), the prevalence of weight gain attempts was highest in those classified as “underweight” by BMI. Yet, 17.1% of men classified within the “normal” BMI range and 8.0% of men classified within the “obese” BMI range reported weight gain attempts (Figure 1).

Among both men (49.0%) and women (42.1%), the prevalence of weight gain attempts was highest among those who perceived themselves to be underweight. Attempts to gain weight were endorsed by approximately 1 in 10 men who perceived themselves to be of just about the right weight and by approximately 1 in 16 men who perceived themselves to be obese (Figure 2).

Across all five countries, the prevalence of weight gain attempts was descriptively higher among men than women (Figure 3). Among women in Australia, the prevalence of weight gain attempts was significantly higher in the 2019 survey than in the 2018 survey. Among men in the United States, the prevalence of weight gain attempts was significantly higher in the 2019 survey than in the 2018 survey. See Table S1 for NNT for all figures.

Results from logistic regression analyses revealed significant associations between the sociodemographic variables and reported weight gain attempts in the past 12 months (Table 2).

4.1 | Men

Among men, compared to those 18 to 29 years old, those who were 30 to 44 years (OR 0.68, 95% CI 0.58–0.79), 45 to 59 years (OR 0.29, 95% CI 0.24–0.35), and ≥60 years (OR 0.17, 95% CI 0.14–0.22) had

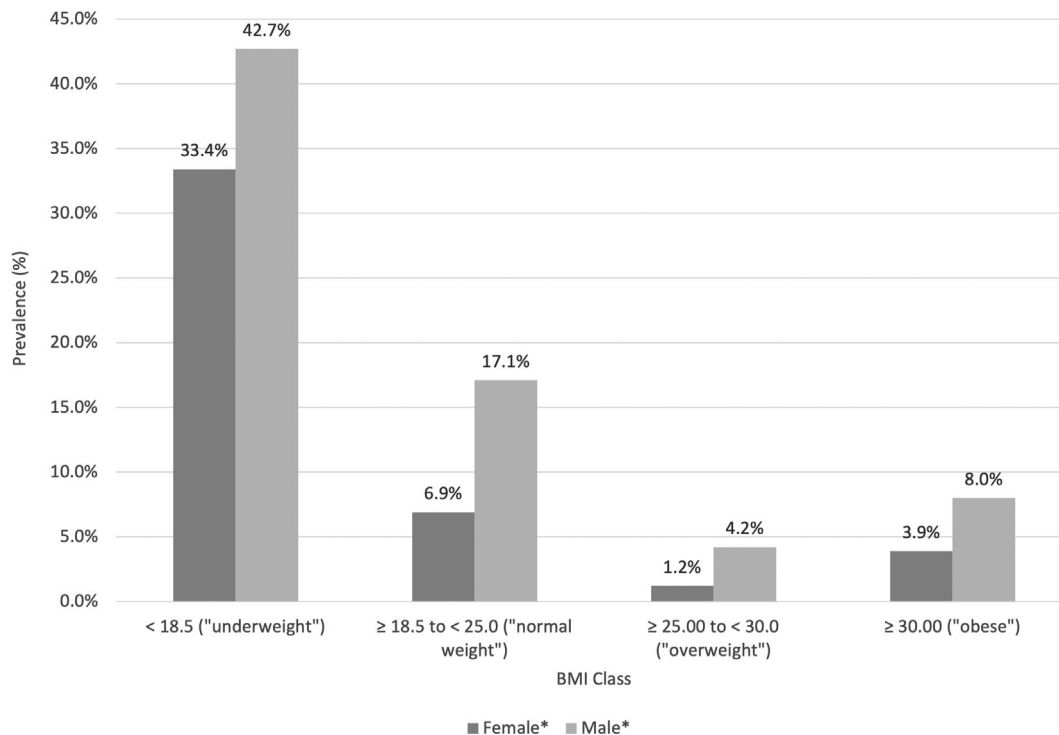


FIGURE 1 Unadjusted prevalence of weight gain attempts in the past 12 months, by sex and BMI category **p* < .001

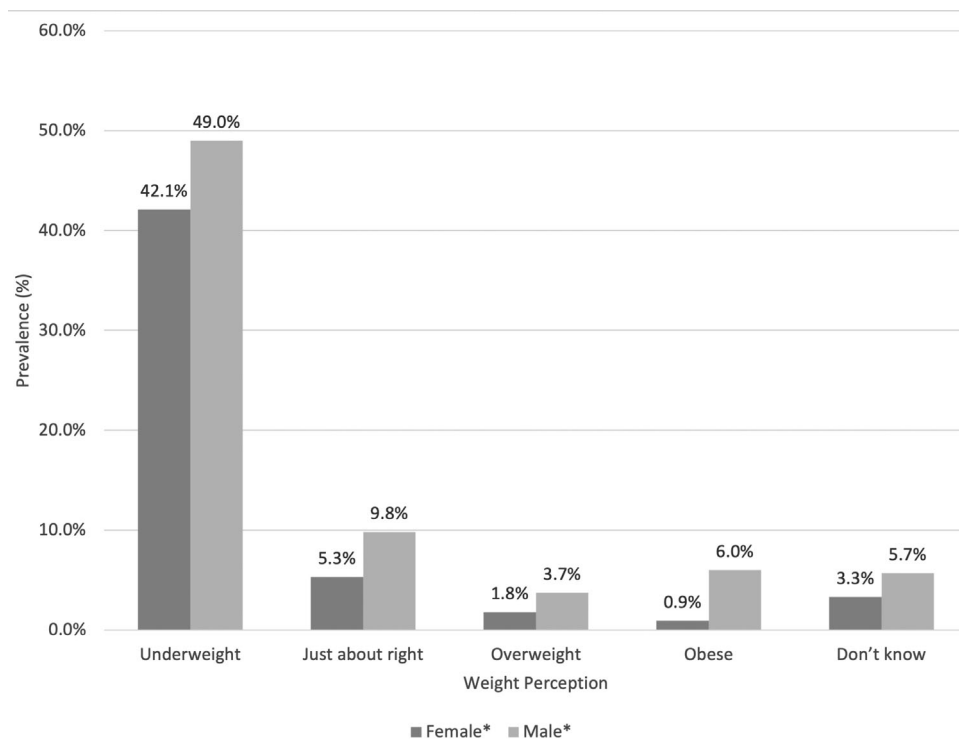


FIGURE 2 Unadjusted prevalence of weight gain attempts in the past 12 months, by sex and weight perception **p* < .001

lower odds of reporting weight gain attempts. Compared to men identifying with a majority race/ethnicity group, those identifying with a minority group had higher odds of reporting weight gain attempts (OR 1.43, 95% CI 1.23–1.66). Compared to men with lower education, those with high education had lower odds of reporting weight gain

attempts (OR 0.74, 95% CI 0.64–0.86). Compared to men who were classified as “underweight” per BMI categories, those who were classified as “overweight” (OR 0.34, 95% CI 0.24–0.47), and “obese” (OR 0.50, 95% CI 0.36–0.70) per BMI categories had lower odds of reporting weight gain attempts. Compared to men who perceived

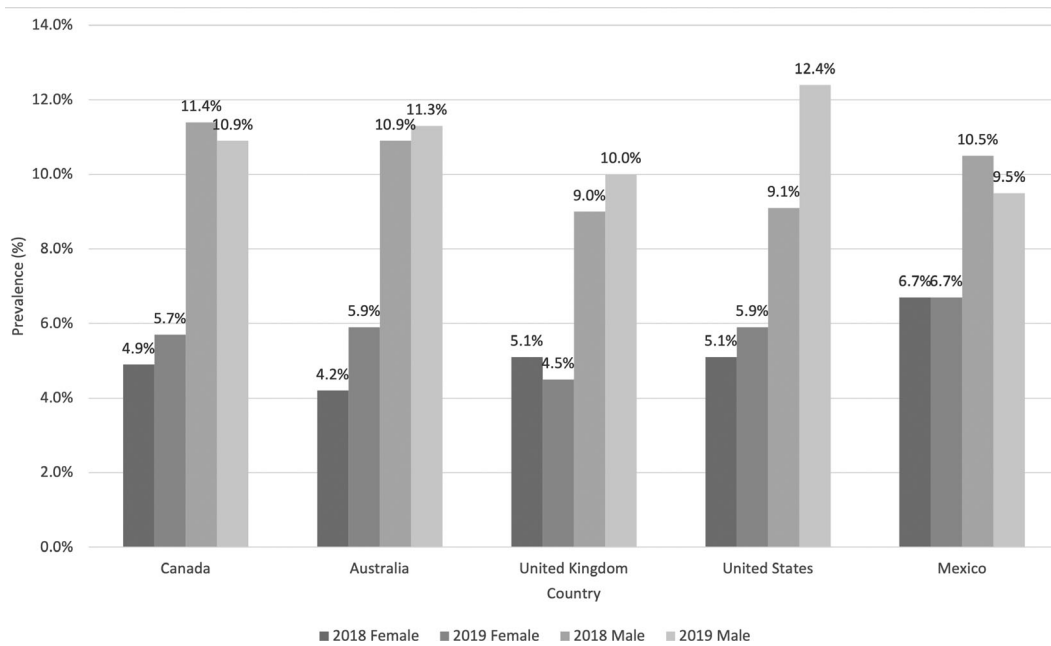


FIGURE 3 Unadjusted prevalence of weight gain attempts in the past 12 months, by sex, country, and survey year. Significant difference among women in Australia ($p < .05$) and men in the United States ($p < .01$) between 2018 and 2019. All others not significant ($p > .05$)

themselves as underweight, those who perceived themselves as just about right (OR 0.13, 95% CI 0.11–0.15), overweight (OR 0.07, 95% CI 0.06–0.09), obese (OR 0.11, 95% CI 0.08–0.16), and don't know (OR 0.07, 95% CI 0.03–0.16) had lower odds of reporting weight gain attempts.

4.2 | Women

Among women, compared to those 18 to 29 years old, those who were 30 to 44 years (OR 0.65, 95% CI 0.53–0.80), 45 to 59 years (OR 0.41, 95% CI 0.32–0.43), and ≥ 60 years (OR 0.37, 95% CI 0.29–0.49) had lower odds of reporting weight gain attempts. Compared to women identifying with a majority race/ethnicity group, those identifying with a minority group had higher odds of reporting weight gain attempts (OR 1.64, 95% CI 1.34–2.00). Compared to women with lower education, those with medium education (OR 0.80, 95% CI 0.64–0.98) and high education (OR 0.78, 95% CI 0.64–0.95) had lower odds of reporting weight gain attempts. Compared to women who were classified as “underweight” per BMI categories, those who were classified as “normal weight” (OR 0.50, 95% CI 0.38–0.66), “overweight” (OR 0.19, 95% CI 0.12–0.29), and “obese” (OR 0.49, 95% CI 0.36–0.68) per BMI categories had lower odds of reporting weight gain attempts. Compared to women who perceived themselves as underweight, those who perceived themselves as just about right (OR 0.10, 95% CI 0.08–0.13), overweight (OR 0.05, 95% CI 0.04–0.07), obese (OR 0.02, 95% CI 0.01–0.03), and don't know (OR 0.06, 95% CI 0.02–0.19) had lower odds of reporting weight gain attempts.

In the analysis that included country as an independent variable, with Mexico as the reference category (Table 3), results were

significant only among men. Compared to men from Mexico, men from Canada (OR 1.35, 95% CI 1.12–1.62), Australia (OR 1.36, 95% CI 1.11–1.68), and the United States (OR 1.39, 95% CI 1.15–1.69) had higher odds of reporting weight gain attempts.

4.3 | Additional Results

In the analysis investigating the association between weight perception accuracy and weight gain attempts (Table 4), results showed that, compared to those with accurate weight perception, men (adjusted odds ratio [AOR] 1.50, 95% CI 1.33–1.70) and women (AOR 1.46, 95% CI 1.24–1.70) who under perceive their weight had higher odds of reporting weight gain attempts.

Finally, additional analyses were conducted to investigate the associations between body perception and weight gain attempts among both men and women. Methods and results are reported in the supporting information.

5 | DISCUSSION

The results from this study showed that over 10% of men recruited from five high- or middle-income countries reported weight gain attempts in the past 12 months at the time of study. Consistent with hypotheses, and theories outlining the gendered nature of weight and shape-related social pressures (Ata et al., 2015; Donovan et al., 2020; Tylka, 2011, 2021), this prevalence in men was approximately double that of women with modest effect size. Interestingly, the prevalence of weight gain attempts among men in this study was lower than that

	Men <i>n</i> = 20,641		Women <i>n</i> = 21,467	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
Age				
18–29 years	Ref.	Ref.	Ref.	Ref.
30–44 years	0.68 (0.58–0.79)	<.001	0.65 (0.53–0.80)	<.001
45–59 years	0.29 (0.24–0.35)	<.001	0.41 (0.32–0.53)	<.001
≥60 years	0.17 (0.14–0.22)	<.001	0.37 (0.29–0.49)	<.001
Race/ethnicity^a				
Majority group	Ref.	Ref.	Ref.	Ref.
Minority group	1.43 (1.23–1.66)	<.001	1.64 (1.34–2.00)	<.001
Not stated	1.05 (0.57–1.92)	.887	0.66 (0.31–1.41)	.283
Education^b				
Low	Ref.	Ref.	Ref.	Ref.
Medium	1.04 (0.88–1.22)	.684	0.80 (0.64–0.98)	.035
High	0.74 (0.64–0.86)	<.001	0.78 (0.64–0.95)	.011
Not stated	0.56 (0.19–1.68)	.304	1.02 (0.42–2.49)	.956
BMI category				
<18.5 (“underweight”)	Ref.	Ref.	Ref.	Ref.
≥18.5 to <25.0 (“normal weight”)	0.77 (0.57–1.04)	.086	0.50 (0.38–0.66)	<.001
≥25.0 to <30.0 (“overweight”)	0.34 (0.24–0.47)	<.001	0.19 (0.12–0.29)	<.001
≥30.0 (“obese”)	0.50 (0.36–0.70)	<.001	0.49 (0.36–0.68)	<.001
Weight perception				
Underweight	Ref.	Ref.	Ref.	Ref.
Just about right	0.13 (0.11–0.15)	<.001	0.10 (0.08–0.13)	<.001
Overweight	0.07 (0.06–0.09)	<.001	0.05 (0.04–0.07)	<.001
Obese	0.11 (0.08–0.16)	<.001	0.02 (0.01–0.03)	<.001
Don't know	0.07 (0.03–0.16)	<.001	0.06 (0.02–0.19)	<.001
Self-rated mental health				
Poor	Ref.	Ref.	Ref.	Ref.
Fair	1.23 (0.90–1.67)	.188	1.35 (0.95–1.91)	.096
Good	1.16 (0.87–1.55)	.321	1.04 (0.74–1.45)	.831
Very good	1.16 (0.86–1.55)	.326	1.03 (0.73–1.45)	.871
Excellent	1.05 (0.76–1.43)	.776	1.15 (0.78–1.68)	.482
Don't know	1.12 (0.61–2.08)	.712	1.00 (0.37–2.70)	.999
Survey year	1.04 (0.92–1.19)	.458	1.07 (0.90–1.26)	.456

TABLE 2 Associations between sociodemographic variables and survey year and weight gain attempts in the past 12 months among men and women from the 2018 and 2019 International Food Policy Study (*N* = 42,108)

Note: Analyses included sample weights. Table displays two logistic regression models (male, female) and the contribution of each independent variable on weight gain attempts in the past 12 months. Boldface indicates statistical significance $p < .05$.

Abbreviations: BMI, body mass index; CI, confidence interval; OR, odds ratio.

^aRace/ethnicity categories in each country as per census questions asked in each country: Australia: majority = only speaks English at home, minority = speaks a language besides English at home; Canada: majority = “White (European descent),” minority = any other race/ethnicity; Mexico: majority = nonindigenous, minority = indigenous; United Kingdom: majority = “White,” minority = any other race/ethnicity; United States: majority = “White,” minority = any other race/ethnicity.

^bEducation level was categorized as “low” (i.e., completed secondary school or less), “medium” (i.e., some postsecondary qualifications), or “high” (i.e., university degree or higher) according to country-specific criteria of the highest level of formal education attained.

found in prior studies of male adolescents, which have reported prevalence ranging from 13 to 30% among adolescent boys and young adult men in Canada, the United States, and the United Kingdom (Calzo et al., 2013; Minnick et al., 2020; Nagata et al., 2020; Nagata, Bibbins-Domingo, et al., 2019; Solmi et al., 2020). Conversely, weight

TABLE 3 Associations between sociodemographic variables, survey year, and country and weight gain attempts in the past 12 months among men from the 2018 and 2019 International Food Policy Study (N = 20,641)

	Men	
	OR (95% CI)	p
Age		
18–29 years	Ref.	Ref.
30–44 years	0.66 (0.57–0.77)	<.001
45–59 years	0.28 (0.23–0.34)	<.001
≥60 years	0.17 (0.13–0.21)	<.001
Race/ethnicity ^a		
Majority group	Ref.	Ref.
Minority group	1.38 (1.18–1.60)	<.001
Not stated	1.04 (0.57–1.92)	.877
Education ^b		
Low	Ref.	Ref.
Medium	1.04 (0.88–1.23)	.645
High	0.79 (0.68–0.92)	.002
Not stated	0.56 (0.19–1.70)	.309
BMI category		
<18.5 (“underweight”)	Ref.	Ref.
≥18.5 to <25.0 (“normal weight”)	0.79 (0.58–1.07)	.130
≥25.0 to <30.0 (“overweight”)	0.35 (0.25–0.49)	<.001
≥30.0 (“obese”)	0.52 (0.37–0.72)	<.001
Weight perception		
Underweight	Ref.	Ref.
Just about right	0.13 (0.11–0.15)	<.001
Overweight	0.07 (0.06–0.09)	<.001
Obese	0.11 (0.07–0.16)	<.001
Don't know	0.07 (0.03–0.15)	<.001
Self-rated mental health		
Poor	Ref.	Ref.
Fair	1.26 (0.92–1.72)	.143
Good	1.20 (0.89–1.61)	.220
Very good	1.20 (0.89–1.62)	.232
Excellent	1.08 (0.78–1.48)	.647
Don't know	1.14 (0.62–2.12)	.670
Country		
Mexico	Ref.	Ref.
Canada	1.35 (1.12–1.62)	.002
Australia	1.36 (1.11–1.68)	.002

(Continues)

TABLE 3 (Continued)

	Men	
	OR (95% CI)	p
United Kingdom	1.21 (0.99–1.46)	.055
United States	1.39 (1.15–1.69)	.001
Survey year	1.05 (0.93–1.20)	.419

Note: Analyses included sample weights. Table displays one logistic regression model and the contribution of each independent variable on weight gain attempts in the past 12 months. Boldface indicates statistical significance $p < .05$.

Abbreviations: BMI, body mass index; CI, confidence interval; OR, odds ratio.

^aRace/ethnicity categories in each country as per census questions asked in each country: Australia: majority = only speaks English at home, minority = speaks a language besides English at home; Canada: majority = “White (European descent),” minority = any other race/ethnicity; Mexico: majority = nonindigenous, minority = indigenous; United Kingdom: majority = “White,” minority = any other race/ethnicity; United States: majority = “White,” minority = any other race/ethnicity.

^bEducation level was categorized as “low” (i.e., completed secondary school or less), “medium” (i.e., some postsecondary qualifications), or “high” (i.e., university degree or higher) according to country-specific criteria of the highest level of formal education attained.

gain attempts among women in the present study are comparable to prior findings among adolescent girls and young adult women in Canada, the United States, and the United Kingdom (4–6%; Minnick et al., 2020; Nagata, Bibbins-Domingo, et al., 2019; Nagata et al., 2020; Solmi et al., 2020). One likely explanation for this discrepancy in prevalence among men is the much wider age range in the current sample (i.e., a substantial majority of participants were 30 years or older). In general, adolescent boys and young adult men experience high levels of body dissatisfaction (Bucchianeri, Arikian, Hannan, Eisenberg, & Neumark-Sztainer, 2013; Murray et al., 2020), and 90% of college men in the United States report wanting to be more muscular (Frederick et al., 2007), which, given the influence of sociocultural male body ideals, is potentially related to muscularity concerns (Calzo et al., 2016). This notion is indirectly supported by our results indicating that, among both men and women, weight gain attempts were less prevalent among older age groups. These findings suggest that there may be some value in the public health and policy-related prevention and intervention efforts, although more research is needed. Specifically, future research should investigate the utility of such efforts that focus on weight- and appearance-change behaviors, particularly weight gain attempts, as well as considering populations for whom these efforts may have particular applicability (i.e., adolescent boys and young adult men). However, despite an overall dearth of research explicitly exploring weight gain attempts among men in middle- and older-adulthood (Brown & Lavender, 2021), it is notable that men in these older age groups do experience body dissatisfaction, including concerns related to perceived reductions in athleticism and muscularity (Lodge & Umberson, 2013), which may be driven by natural weight gain as one ages (Chu et al., 2021; Viner, Costa, & Johnson, 2019; Yang et al., 2021). As such, this warrants additional research to inform

	Men <i>n</i> = 20,641		Women <i>n</i> = 21,467	
	AOR ^a (95% CI)	<i>p</i>	AOR ^a (95% CI)	<i>p</i>
Weight perception accuracy ^b				
Accurate perception	Ref.	Ref.	Ref.	Ref.
Under perceive weight	1.50 (1.33–1.70)	<.001	1.46 (1.24–1.70)	<.001
Over perceive weight	1.13 (0.88–1.44)	.335	0.86 (0.66–1.14)	.300

TABLE 4 Associations between weight perception accuracy and weight gain attempts in the past 12 months among men and women from the 2018 and 2019 International Food Policy Study (*N* = 42,108)

Note: Analyses included sample weights. Table displays two logistic regression models (male, female) and the contribution of the independent variable on weight gain attempts in the past 12 months. Boldface indicates statistical significance $p < .05$.

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

^aAdjusted for age, race/ethnicity, education, self-rated mental health, and survey year.

^bWeight perception accuracy: accurate weight perception included those whose body mass index (BMI) category and weight perception align; under perceive weight included those whose BMI category is higher than their weight perception; over perceive weight included those whose BMI category is lower than their weight perception. Those who reported “don’t know” ($n = 325$) for weight perception were excluded from this analysis.

effective clinical, public health, and policy-related efforts for adult men across the lifespan.

Also consistent with hypotheses, and theories highlighting the role of social identities in weight- and appearance-change behaviors (Rodgers, Berry, & Franko, 2018), identifying with a country-specific minority racial or ethnic group, compared to a country-specific majority racial or ethnic group, was associated with modestly higher odds of weight gain attempts among both men and women. Research in the United States has shown that, compared to their White peers, Hispanic (Nagata et al., 2020) and black boys and Hispanic, black, and Asian girls (Nagata, Bibbins-Domingo, et al., 2019) are more likely to report weight gain attempts. This is consistent with evidence that disordered eating and unhealthy weight control strategies may also be overrepresented among racial/ethnic minority populations (Beccia et al., 2019; Ricciardelli, McCabe, Williams, & Thompson, 2007; Rodgers, Berry, & Franko, 2018). However, it should be noted that the minority experience in one country may be completely different in another. Therefore, future research is needed to clarify the experience of minority status as it relates to weight gain attempts amongst and across multiple countries.

One potential explanation for this finding is that sociocultural and minority stress factors associated with a minority identity may influence both body dissatisfaction and weight gain attempts (Ricciardelli et al., 2007; Rodgers, Berry, & Franko, 2018); thus, these individuals may be more susceptible to striving for an ideal body as a means to “fit in” or weight gain attempts may be a mechanism to increasing physical safety, where being perceived as formidable could mitigate discriminatory behaviors. Similarly, both men and women with high education, compared to those with low education, had modestly lower odds of weight gain attempts. It may be that individuals in this group are not as negatively impacted by body ideals or have more general health education about the dangers of altering body weight, resulting in fewer attempts to change their bodies. Furthermore, it has been shown that individuals who participate in vocational schooling

(vs. general schooling) engage in greater disordered eating behaviors (Kim et al., 2018).

Throughout our analyses, we found unique patterns of association between weight gain attempts and BMI category, weight perception, and weight perception accuracy. Among both men and women, participants classified in higher BMI categories, compared to those with BMI <18, and who perceived themselves to be of higher weight, compared to those who perceived themselves to be underweight, had lower odds of weight gain attempts. However, weight gain attempts were relatively common among men (17%) who were classified within a “normal” weight range by BMI category and 10% of men who perceived themselves to be of normal weight, with strong effect sizes. Relatedly, a novel finding was that both men and women who under perceived their weight (i.e., their BMI category was higher than their weight perception), compared to those who accurately perceive their weight, had marginally higher odds of weight gain attempts. Cumulatively, these findings may provide evidence that (mis)perception of one’s body weight is a distinctive feature of weight gain attempts (Calzo et al., 2013; Minnick et al., 2020; Nagata, Bibbins-Domingo, et al., 2019), suggesting that weight gain attempts may be linked to a desire to modify one’s body weight or shape for a specific purpose.

Results investigating differences between survey years and across the countries showed that, descriptively, men in both the 2018 and the 2019 survey years and across each of the five countries had higher prevalence of weight gain attempts than women by an average of two to one. Across the two survey years, women in Australia and men in the United States showed a significantly higher prevalence of weight gain attempts in 2019 versus 2018 with strong effect sizes for both men and women. The highest prevalence of weight gain attempts was in the sample of men from the United States who completed the 2019 survey. This is consistent with findings from several studies reporting high occurrence of weight gain attempts (Nagata et al., 2020; Nagata, Bibbins-Domingo, et al., 2019) among boys and young men in the United States, which may provide evidence that

specific body ideals have a particularly significant influence on body image and weight change behaviors among adult men in the United States. Likewise, recent evidence has suggested that women are increasingly experiencing pressures to adhere to a fit and lean body ideal ((Galliger) Kelley, Neufeld, & Musher-Eizenman, 2010; Rodgers, Franko, et al., 2018), including from social media (e.g., #fitspiration; Tiggemann & Zaccardo, 2018), which could explain the higher prevalence of weight gain attempts (particularly if related to the pursuit of toned muscularity and shapeliness) among women from Australia in 2019 versus 2018. Lastly, compared to men in Mexico, men in Canada, Australia, the United Kingdom, and the United States had modestly higher odds of weight gain attempts, which may suggest there are potential differences between high- and middle-income countries in terms of weight-related body change behaviors and pressures to adhere to a specific body ideal.

Overall, our findings have several implications for health care practitioners and public health professionals. First, roughly 1 in 10 adult men across five countries report having attempted to gain weight in the past 12 months, and 1 in 6 of men endorsing weight gain attempts have a BMI classified within the “normal” weight range. This finding is salient given that weight gain attempts among these individuals may be medically unnecessary and could increase risk for disordered eating behaviors or unhealthy excess weight gain over time (Calzo et al., 2013; Chu et al., 2021; Nagata, Bibbins-Domingo, et al., 2019). Nevertheless, these results support prior research and emphasize that men may not be immune to weight and body dissatisfaction (Cafri et al., 2005; Murray et al., 2020). However, while the BMI categories may aid interpretation, they have been shown to be limited in terms of their usefulness as individual-level indicators of health status or outcomes (Tylka et al., 2014). Additionally, BMI is unable to differentiate between fat mass and muscle mass (Ganson, Murray, & Nagata, 2019). Second, findings regarding higher prevalence of weight gain attempts among racial/ethnic minorities highlight the extra burden within these populations. Health care professionals should consider assessing for body dissatisfaction, weight gain attempts, and weight control behaviors among patients, particularly those who may be at elevated risk and regardless of “normal” weight status, and provide guidance and psychoeducation on weight change behaviors (e.g., dangers of performance-enhancing substances, disordered eating, excessive exercise). Health care professionals should also consider the unique pressures on male and female patients of racial/ethnic minority groups that may influence their weight gain behaviors. Third, the results from this study indicate that weight gain attempts are fairly consistent across countries, although there is a need for additional research in other “non-Westernized” countries. Fourth, research is needed to more comprehensively understand this behavior in order to guide public health and policy intervention to address problematic behaviors and outcomes associated with weight gain attempts (Ganson, Murray, & Nagata, 2020). Fifth, future research is needed to explore the relationships between weight gain attempts and additional psych-social factors (e.g., substance use, disordered eating, diet, food insecurity, weight stigma/discrimination), particularly among an international sample of participants, to provide

greater clarity of this behavior and to further identify whether this behavior is a problem needing to be addressed by health care and public health professionals. Finally, while the findings of this study are novel in regard to weight gain attempts, it should be noted that over a third (37.3%) of men and over half (51.3%) of women, representing a majority for both sexes, reported weight loss attempts in the past 12 months at the time of study. Thus, the findings relating to weight gain attempts should be considered within the greater prevalence of attempts to lose weight across five distinct countries.

5.1 | Strengths and limitations

Strengths of this study include the large and international sample of men and women, ranging from 18 to 99 years of age, with a mean age of 45 years. In particular, the current study expands on prior research that has predominately focused on adolescents and young adults. The use of participants from five countries also allowed for the first direct cross-country comparisons study on this topic. Lastly, utilizing two survey years ensured that the results are not episodic and instead represent a consistent behavior among both men and women across the five countries.

Despite these strengths, there are limitations to be noted. First, the findings do not provide nationally representative estimates and overall participation rates were low, including those among minority groups. However, the data and analyses were weighted in an attempt to maximize external validity. Second, responses were based on self-report, which may increase social desirability bias. Relatedly, this study grouped age and BMI into categorical variables to align with prior research and for ease of interpretation; however, this precluded additional analyses that could have been informative if continuous data were used for these variables. Third, the single-item measure used to assess weight gain attempts in the IFPS did not assess the frequency or type of specific behaviors engaged in, which would provide greater specificity; this item also did not specify the underlying motivation for pursuing weight gain (e.g., benefits of increased size for physical performance, appearance enhancement, health concerns from being underweight), nor did it address whether increasing weight itself (i.e., the number on the scale) or changing body shape and composition (e.g., increasing muscularity specifically) was the ultimate goal. Future research with more nuanced assessments of the nature, type, and motivations for weight gain attempts is thus recommended. Fourth, while prior research has shown that there are differences in weight gain attempts and behaviors across sexual orientations (Calzo et al., 2013; Nagata, Bibbins-Domingo, et al., 2019), the IFPS does not include a measure on sexual orientation; comparisons or adjustments based on sexual orientation were thus not possible. Relatedly, there were only 224 (0.51%) transgender/gender nonconforming individuals; therefore, we limited our analyses to sex assigned at birth given the lack of statistical power to analyze this group, as well as to align with prior research on weight gain attempts. Future research should explore weight gain attempts among all gender identities. Lastly, while prior research has utilized a minority/majority dichotomous variable for grouping racial and ethnic groups across countries (Forde

et al., 2019; Kwon et al., 2019; Vanderlee et al., 2021), there may be nuances in the nature and prevalence of weight gain attempts across unique racial and ethnic groups within each country. Additionally, interactions may exist between age, BMI, race/ethnicity, and education that influence how they are individually associated with weight gain attempts; thus, more research is needed to clarify these interacting relationships.

6 | CONCLUSION

This study is the first to investigate the prevalence and correlates of weight gain attempts in adult men and women across five high- and middle-income countries. Results showed that a substantial minority of men in Canada, Australia, the United Kingdom, the United States, and Mexico endorse weight gain attempts, at an overall rate of approximately two to one compared to women. Although weight gain attempts were especially prevalent among men classified within the “underweight” BMI range, approximately one in six men who reported weight gain attempts were classified within the “normal” BMI range. Lastly, among both men and women, identifying with a country-specific racial or ethnic minority group was associated with greater odds of reporting weight gain attempts.

ACKNOWLEDGMENTS

We would like to thank Nicole E. Lisi for providing research assistance, Jiayue Yu for providing statistical assistance, and Samuel Benabou for providing editorial assistance. Funding for the International Food Policy Study was provided by a Canadian Institutes of Health Research (CIHR) Project Grant, with additional support from an International Health Grant, the Public Health Agency of Canada (PHAC), and a CIHR–PHAC Applied Public Health Chair (Hammond). No direct funding was used to support this study.

CONFLICT OF INTEREST

All authors report no conflicts of interest.

DATA AVAILABILITY STATEMENT

The International Food Policy Study is available to researchers. Please visit <http://foodpolicystudy.com/> for more information.

ORCID

Kyle T. Ganson  <https://orcid.org/0000-0003-3889-3716>

Jason M. Nagata  <https://orcid.org/0000-0002-6541-0604>

Jason M. Lavender  <https://orcid.org/0000-0001-9853-2280>

Rachel F. Rodgers  <https://orcid.org/0000-0002-2582-4220>

Mitchell L. Cunningham  <https://orcid.org/0000-0002-6158-5773>

Stuart B. Murray  <https://orcid.org/0000-0002-5588-2915>

REFERENCES

Ata, R. N., Schaefer, L. M., & Thompson, J. K. (2015). Sociocultural theories of eating disorders. In *The Wiley handbook of eating disorders* (pp. 269–

282). West Sussex, England: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118574089.ch21>

Baghurst, T., Hollander, D. B., Nardella, B., & Haff, G. G. (2006). Change in sociocultural ideal male physique: An examination of past and present action figures. *Body Image*, 3(1), 87–91. <https://doi.org/10.1016/j.bodyim.2005.11.001>

Beccia, A. L., Baek, J., Jesdale, W. M., Austin, S. B., Forrester, S., Curtin, C., & Lapane, K. L. (2019). Risk of disordered eating at the intersection of gender and racial/ethnic identity among U.S. high school students. *Eating Behaviors*, 34, 101299. <https://doi.org/10.1016/j.eatbeh.2019.05.002>

Bennett, E. V., Hurd, L. C., Pritchard, E. M., Colton, T., & Crocker, P. R. E. (2020). An examination of older men's body image: How men 65 years and older perceive, experience, and cope with their aging bodies. *Body Image*, 34, 27–37. <https://doi.org/10.1016/j.bodyim.2020.04.005>

Brown, T. A., Forney, K. J., Klein, K. M., Grillo, C., & Keel, P. K. (2020). A 30-year longitudinal study of body weight, dieting, and eating pathology across women and men from late adolescence to later midlife. *Journal of Abnormal Psychology*, 129(4), 376–386. <https://doi.org/10.1037/abn0000519>

Brown, T. A., & Lavender, J. M. (2021). Eating disorders and body image across the lifespan: A focus on boys and men in midlife and beyond. In J. M. Nagata, T. A. Brown, S. B. Murray, & J. M. Lavender (Eds.), *Eating disorders in boys and men* (pp. 317–333). Cham, CH: Springer International. https://doi.org/10.1007/978-3-030-67127-3_21

Bucchianeri, M. M., Arikian, A. J., Hannan, P. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Body dissatisfaction from adolescence to young adulthood: Findings from a 10-year longitudinal study. *Body Image*, 10(1), 1–7. <https://doi.org/10.1016/j.bodyim.2012.09.001>

Cafri, G., Thompson, J. K., Ricciardelli, L., McCabe, M., Smolak, L., & Yesalis, C. (2005). Pursuit of the muscular ideal: Physical and psychological consequences and putative risk factors. *Clinical Psychology Review*, 25(2), 215–239. <https://doi.org/10.1016/j.cpr.2004.09.003>

Calzo, J. P., Corliss, H. L., Blood, E. A., Field, A. E., & Austin, S. B. (2013). Development of muscularity and weight concerns in heterosexual and sexual minority males. *Health Psychology*, 32(1), 42–51. <https://doi.org/10.1037/a0028964>.Development

Calzo, J. P., Horton, N. J., Sonnevile, K. R., Swanson, S. A., Crosby, R. D., Micali, N., ... Field, A. E. (2016). Male eating disorder symptom patterns and health correlates from 13 to 26 years of age. *Journal of the American Academy of Child and Adolescent Psychiatry*, 55(8), 693–700. <https://doi.org/10.1016/j.jaac.2016.05.011>

Centers for Disease Control and Prevention. (2020). *Assessing your weight*. <https://www.cdc.gov/healthyweight/assessing/index.html>

Chu, J., Ganson, K. T., Vittinghoff, E., Mitchison, D., Hay, P., Tabler, J., ... Nagata, J. M. (2021). Weight goals, disordered eating behaviors, and BMI trajectories in US young adults. *Journal of General Internal Medicine*. <https://doi.org/10.1007/s11606-021-06702-y>

Donovan, C. L., Uhlmann, L. R., & Loxton, N. J. (2020). Strong is the new skinny, but is it ideal?: A test of the tripartite influence model using a new measure of fit-ideal internalisation. *Body Image*, 35, 171–180. <https://doi.org/10.1016/j.bodyim.2020.09.002>

Forde, H., White, M., Levy, L., Greaves, F., Hammond, D., Vanderlee, L., ... Adams, J. (2019). The relationship between self-reported exposure to sugar-sweetened beverage promotions and intake: Cross-sectional analysis of the 2017 international food policy study. *Nutrients*, 11(12). <https://doi.org/10.3390/nu11123047>

Frederick, D. A., Buchanan, G. M., Sadehgi-Azar, L., Peplau, L. A., Haselton, M. G., Berezovskaya, A., & Lipinski, R. E. (2007). Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men and Masculinity*, 8(2), 103–117. <https://doi.org/10.1037/1524-9220.8.2.103>

Ganson, K. T., Murray, S. B., & Nagata, J. M. (2019). Last word: A call to develop specific medical treatment guidelines for adolescent males

- with eating disorders. *Eating Disorders*, 1–7. <https://doi.org/10.1080/10640266.2019.1652474>
- Ganson, K. T., Murray, S. B., & Nagata, J. M. (2020). A call for public policy and research to reduce use of appearance and performance enhancing drugs and substances among adolescents. *The Lancet Child & Adolescent Health*, 4, 13–14. [https://doi.org/10.1016/S2352-4642\(19\)30345-1](https://doi.org/10.1016/S2352-4642(19)30345-1)
- Hazzard, V. M., Hahn, S. L., & Sonnevile, K. R. (2017). Weight misperception and disordered weight control behaviors among U.S. high school students with overweight and obesity: Associations and trends, 1999–2013. *Eating Behaviors*, 26, 189–195. <https://doi.org/10.1016/j.eatbeh.2017.07.001>
- International Food Policy Study. (2021a). *Technical Report 2018 Survey (Wave 2)*. https://foodpolycystudy.com/wp-content/uploads/2021/01/2018-IFPS-Technical-Report_20210115.pdf
- International Food Policy Study. (2021b). *Technical Report 2019 Survey (Wave 3)*. http://foodpolycystudy.com/wp-content/uploads/2021/03/2019-IFPS-Technical-Report_20210301.pdf
- Keel, P. K., Baxter, M. G., Heatherton, T. F., & Joiner, T. E. (2007). A 20-year longitudinal study of body weight, dieting, and eating disorder symptoms. *Journal of Abnormal Psychology*, 116(2), 422–432. <https://doi.org/10.1037/0021-843X.116.2.422>
- (Galliger) Kelley, C. C., Neufeld, J. M., & Musher-Eizenman, D. R. (2010). Drive for thinness and drive for muscularity: Opposite ends of the continuum or separate constructs? *Body Image*, 7(1), 74–77. <https://doi.org/10.1016/j.bodyim.2009.09.008>
- Kim, Y., Austin, S. B., Subramanian, S. V., Thomas, J. J., Eddy, K. T., Franko, D. L., ... Kawachi, I. (2018). Risk factors for disordered weight control behaviors among Korean adolescents: Multilevel analysis of the Korea Youth Risk Behavior Survey. *International Journal of Eating Disorders*, 51(2), 124–138. <https://doi.org/10.1002/eat.22820>
- Kraemer, H. C., & Kupfer, D. J. (2006). Size of treatment effects and their importance to clinical research and practice. *Biological Psychiatry*, 59(11), 990–996. <https://doi.org/10.1016/j.biopsych.2005.09.014>
- Kwon, J., Cameron, A. J., Hammond, D., White, C. M., Vanderlee, L., Bhawra, J., & Sacks, G. (2019). A multi-country survey of public support for food policies to promote healthy diets: Findings from the International Food Policy Study. *BMC Public Health*, 19(1), 1–10. <https://doi.org/10.1186/s12889-019-7483-9>
- Lodge, A. C., & Umberson, D. (2013). Age and embodied masculinities: Midlife gay and heterosexual men talk about their bodies. *Journal of Aging Studies*, 27(3), 225–232. <https://doi.org/10.1016/j.jaging.2013.03.004>
- McCabe, M. P., Ricciardelli, L. A., & Finemore, J. (2002). The role of puberty, media and popularity with peers on strategies to increase weight, decrease weight and increase muscle tone among adolescent boys and girls. *Journal of Psychosomatic Research*, 52(3), 145–153. [https://doi.org/10.1016/S0022-3999\(01\)00272-0](https://doi.org/10.1016/S0022-3999(01)00272-0)
- McCreary, D. R., Sasse, D. K., Saucier, D. M., & Dorsch, K. D. (2004). Measuring the drive for muscularity: Factorial validity of the drive for muscularity scale in men and women. *Psychology of Men and Masculinity*, 5(1), 49–58. <https://doi.org/10.1037/1524-9220.5.1.49>
- McVey, G., Tweed, S., & Blackmore, E. (2005). Correlates of weight loss and muscle-gaining behavior in 10- to 14-year-old males and females. *Preventive Medicine*, 40(1), 1–9. <https://doi.org/10.1016/j.ypmed.2004.04.043>
- Minnick, C., Raffoul, A., Hammond, D., & Kirkpatrick, S. I. (2020). Intentional weight gain efforts among young Canadian adults aged 17–32 years. *Eating Behaviors*, 38, 101407. <https://doi.org/10.1016/j.eatbeh.2020.101407>
- Murray, S. B., Brown, T. A., Lavender, J. M., Nagata, J. M., & Keel, P. K. (2020). The evolving nature of weight dissatisfaction and eating behaviors among men: Secular trends among college men across four decades. *Journal of Abnormal Psychology*, 129(8), 824–830. <https://doi.org/10.1037/abn0000587>
- Murray, S. B., Nagata, J. M., Griffiths, S., Calzo, J. P., Brown, T. A., Mitchison, D., ... Mond, J. M. (2017). The enigma of male eating disorders: A critical review and synthesis. *Clinical Psychology Review*, 57, 1–11. <https://doi.org/10.1016/j.cpr.2017.08.001>
- Nagata, J. M., Bibbins-Domingo, K., Garber, A. K., Griffiths, S., Vittinghoff, E., & Murray, S. B. (2019). Boys, bulk, and body ideals: Sex differences in weight-gain attempts among adolescents in the United States. *Journal of Adolescent Health*, 64(4), 450–453. <https://doi.org/10.1016/j.jadohealth.2018.09.002>
- Nagata, J. M., Ganson, K. T., Griffiths, S., Mitchison, D., Garber, A. K., Vittinghoff, E., ... Murray, S. B. (2020). Prevalence and correlates of muscle-enhancing behaviors among adolescents and young adults in the United States. *International Journal of Adolescent Medicine and Health*. <https://doi.org/10.1515/ijamh-2020-0001>
- Nagata, J. M., Garber, A. K., Tabler, J. L., Murray, S. B., & Bibbins-Domingo, K. (2018). Prevalence and correlates of disordered eating behaviors among young adults with overweight or obesity. *Journal of General Internal Medicine*, 33(8), 1337–1343. <https://doi.org/10.1007/s11606-018-4465-z>
- Nagata, J. M., Murray, S. B., Bibbins-Domingo, K., Garber, A. K., Mitchison, D., & Griffiths, S. (2019). Predictors of muscularity-oriented disordered eating behaviors in U.S. young adults: A prospective cohort study. *International Journal of Eating Disorders*, February, 52, 1380–1388. <https://doi.org/10.1002/eat.23094>
- Ojala, K., Vereecken, C., Välimaa, R., Currie, C., Villberg, J., Tynjälä, J., & Kannas, L. (2007). Attempts to lose weight among overweight and non-overweight adolescents: A cross-national survey. *International Journal of Behavioral Nutrition and Physical Activity*, 4, 1–10. <https://doi.org/10.1186/1479-5868-4-50>
- Piernas, C., Aveyard, P., & Jebb, S. A. (2016). Recent trends in weight loss attempts: Repeated cross-sectional analyses from the health survey for England. *International Journal of Obesity*, 40(11), 1754–1759. <https://doi.org/10.1038/ijo.2016.141>
- Pope, H. G., Khalsa, J. H., & Bhasin, S. (2017). Body image disorders and abuse of anabolic-androgenic steroids among men. *Journal of the American Medical Association*, 317(1), 23–24. <https://doi.org/10.1001/jama.2016.17441>
- Rancourt, D., Thurston, I. B., Sonnevile, K. R., Milliren, C. E., & Richmond, T. K. (2017). Longitudinal impact of weight misperception and intent to change weight on body mass index of adolescents and young adults with overweight or obesity. *Eating Behaviors*, 27, 7–13. <https://doi.org/10.1016/j.eatbeh.2017.08.002>
- Ricciardelli, L. A., McCabe, M. P., Williams, R. J., & Thompson, J. K. (2007). The role of ethnicity and culture in body image and disordered eating among males. *Clinical Psychology Review*, 27(5), 582–606. <https://doi.org/10.1016/j.cpr.2007.01.016>
- Robinson, E., Sutin, A. R., & Daly, M. (2018). Self-perceived overweight, weight loss attempts, and weight gain: Evidence from two large, longitudinal cohorts. *Health Psychology*, 37(10), 940–947. <https://doi.org/10.1037/hea0000659>
- Rodgers, R. F., Berry, R., & Franko, D. L. (2018). Eating disorders in ethnic minorities: An update. *Current Psychiatry Reports*, 20(10), 90. <https://doi.org/10.1007/s11920-018-0938-3>
- Rodgers, R. F., Franko, D. L., Lovering, M. E., Luk, S., Pernal, W., & Matsumoto, A. (2018). Development and validation of the female muscularity scale. *Sex Roles*, 78(1–2), 18–26. <https://doi.org/10.1007/s11199-017-0775-6>
- Solmi, F., Sharpe, H., Gage, S. H., Maddock, J., Lewis, G., & Patalay, P. (2020). Changes in the prevalence and correlates of weight-control behaviors and weight perception in adolescents in the UK, 1986–2015. *JAMA Pediatrics*, 175, 1–10. <https://doi.org/10.1001/jamapediatrics.2020.4746>
- Sonneville, K. R., Thurston, I. B., Milliren, C. E., Gooding, H. C., & Richmond, T. K. (2016). Weight misperception among young adults with overweight/obesity associated with disordered eating behaviors.

- International Journal of Eating Disorders*, 49(10), 937–946. <https://doi.org/10.1002/eat.22565>
- Tiggemann, M., & Zaccardo, M. (2018). ‘Strong is the new skinny’: A content analysis of #fitspiration images on Instagram. *Journal of Health Psychology*, 23(8), 1003–1011. <https://doi.org/10.1177/1359105316639436>
- Tylka, T. L. (2011). Refinement of the tripartite influence model for men: Dual body image pathways to body change behaviors. *Body Image*, 8(3), 199–207. <https://doi.org/10.1016/j.bodyim.2011.04.008>
- Tylka, T. L. (2021). Models of body image for boys and men. In J. M. Nagata, T. A. Brown, S. B. Murray, & J. M. Lavender (Eds.), *Eating disorders in boys and men* (pp. 7–20). Cham, CH: Springer International. https://doi.org/10.1007/978-3-030-67127-3_2
- Tylka, T. L., Annunziato, R. A., Burgard, D., Danielsdóttir, S., Shuman, E., Davis, C., & Calogero, R. M. (2014). The weight-inclusive versus weight-normative approach to health: Evaluating the evidence for prioritizing well-being over weight loss. *Journal of Obesity*, 2014(4), 1–18. <https://doi.org/10.1155/2014/983495>
- Vanderlee, L., White, C. M., Kirkpatrick, S. I., Rynard, V. L., Jáuregui, A., Adams, J., ... Hammond, D. (2021). Nonalcoholic and alcoholic beverage intakes by adults across 5 upper-middle- and high-income countries. *Journal of Nutrition*, 151(1), 140–151. <https://doi.org/10.1093/jn/nxaa324>
- Viner, R. M., Costa, S., & Johnson, W. (2019). Patterns of BMI development between 10 and 42 years of age and their determinants in the 1970 British Cohort Study. *Journal of Epidemiology and Community Health*, 73(1), 79–85. <https://doi.org/10.1136/jech-2018-211051>
- Yang, Y. C., Walsh, C. E., Johnson, M. P., Belsky, D. W., Reason, M., Curran, P., ... Harris, K. M. (2021). Life-course trajectories of body mass index from adolescence to old age: Racial and educational disparities. *Proceedings of the National Academy of Sciences of the United States of America*, 118(17), 1–11. <https://doi.org/10.1073/pnas.2020167118>

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Ganson, K. T., Nagata, J. M., Lavender, J. M., Rodgers, R. F., L. Cunningham, M., Murray, S. B., & Hammond, D. (2021). Prevalence and correlates of weight gain attempts across five countries. *International Journal of Eating Disorders*, 54(10), 1829–1842. <https://doi.org/10.1002/eat.23595>