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## Boys, Bulk, and Body Ideals: Sex Differences in Weight Gain Attempts Among Adolescents in the United States

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### Abstract

**Objective:** To determine the prevalence of weight gain attempts in adolescent boys in the US.

**Methods:** Participants were 15,624 high school students from the nationally representative 2015 Youth Risk Behavior Survey.

**Results:** Overall, 29.6% of adolescent boys reported attempts to gain weight, including 39.6% of boys who were normal weight, 12.8% who were overweight, and 10.6% who were obese by body mass index (BMI). In contrast, only 6.5% of adolescent girls reported attempts to gain weight. Although only 3.3% of adolescent males are underweight by BMI, 19.3% perceive themselves to be underweight. Further, over half of adolescent males who are overweight by BMI perceive themselves to be about the right weight. Black/African American (Odds ratio [OR] 1.89; 95% confidence interval [CI] 1.50–2.38) and multiracial (OR 1.62; 95% CI 1.16–2.26) adolescent males had greater odds of weight gain attempts than White adolescent males. Adolescent males identifying as bisexual had lower odds (OR 0.47; 95% CI 0.25 – 0.88) of weight gain attempts than adolescent males identifying as heterosexual.

**Conclusions:** Weight gain attempts are common among adolescent boys including those who are considered normal weight, overweight, or obese by BMI; African American or multiracial; and those self-identifying as heterosexual. Consideration of the unique nature of male body image,

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particularly adolescent boys' perceptions of their own weight and weight-gain attempts, should be incorporated into primary care screening for adolescent boys.

### Keywords

adolescent health; body image; weight control

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## Introduction

During the past several decades, the idealized male body image in popular media and action figures of many Western societies has grown increasingly large and muscular.<sup>1,2</sup> Body dissatisfaction in adolescent boys has concurrently increased<sup>3</sup> and exposure to extremely muscular models may be associated with body dissatisfaction in young men.<sup>4,5</sup> Because the ideal body type for males is muscular, this may manifest as a drive to *gain* weight and muscle.<sup>6,7</sup> However, research on weight gain attempts in males is limited.<sup>8</sup> Most research in the field has focused on weight loss attempts, reflecting the ideal body type for females, which is thin.<sup>9</sup>

The limited research on weight gain attempts in population-based studies of adolescent males have estimated the prevalence of weight gain attempts from 8% in Ireland<sup>10</sup> to 30% in the US.<sup>11</sup> Attempts to gain weight among males increase three-fold through adolescence.<sup>11</sup> Exclusively heterosexual adolescent males were more likely to have weight gain attempts than sexual minority males, though sexual minority adolescent males were more likely to have weight misperception.<sup>12</sup> Weight gain attempts may have implications for adolescent obesity.<sup>11</sup> Among adolescent boys attempting to gain weight, most were in the healthy (69%) or overweight/obese (27%) weight status, suggesting that most weight gain attempts were medically unnecessary and could lead to overweight.<sup>11</sup> By national estimates, 20.6% of adolescents are obese by body mass index (BMI) classification,<sup>13</sup> representing a major public health challenge.<sup>14</sup> Adolescent obesity portends profound medical consequences, including a greater risk of coronary heart disease in later adulthood.<sup>15</sup>

Research on attempts to gain weight among adolescent males is limited and has not yet been examined using nationally representative samples in the US.<sup>7</sup> Therefore, the objective of this study was to estimate the prevalence of weight gain attempts in adolescent boys using a nationally representative sample. A secondary objective was to examine differences in weight gain attempts by weight classification, weight self-perception, age, race/ethnicity, and sexual identification.

## Methods

The 2015 National Youth Risk Behavior Survey (YRBS) used a 3-stage, cluster sample of counties from all states, schools (including private schools) within counties, and classrooms within schools, yielding a nationally representative sample of high school students.<sup>16</sup> Students responded privately on computer-scannable questionnaires (response rate=60%). The US Centers for Disease Control and Prevention Institutional Review Board approved the survey, requiring parent consent and student assent. Secondary analysis of these public data was deemed exempt from further review.

Age, race/ethnicity, and sexual identification were based on self-report. To assess weight status, self-reported weight (pounds) and height (inches) were converted to calculate BMI, which was then converted into sex- and age-specific percentiles and then classified as underweight (BMI <5th percentile), normal weight (5th percentile to less than the 85th percentile), overweight (85th to less than the 95th percentile), or obese (95th percentile or greater) in accordance with guidelines from the US Centers for Disease Control and Prevention (CDC).<sup>13</sup>

To assess attempts to change weight, subjects were asked, “which of the following are you trying to do about your weight?” Response categories included (1) gain weight, (2) lose weight, or (3) stay the same weight or not trying to do anything about weight. To assess weight perception, subjects were asked, “how do you describe your weight?” Response categories included (1) very or slightly underweight, (2) about the right weight, or (3) slightly or very overweight.

We used YRBS pre-constructed sample weights to determine estimates for national prevalence.<sup>16</sup> Sex differences in weight status, perception, and attempts were examined using Pearson’s chi-square tests. We used logistic regression analysis to identify associations with weight gain attempts as the dependent variables and age, race/ethnicity, and sexual identification as the independent variables among males. Data analyses were performed in 2018 using STATA 15.0.

## Results

Weight status, perception, and attempts of the 15,624 adolescent subjects are reported in Table 1. Overall, 29.6% of adolescent boys report attempts to gain weight, compared to 6.5% of adolescent girls ( $p < 0.001$ ). Although only 3.3% of adolescent males are underweight by BMI percentile, 19.3% perceive themselves to be underweight.

When stratified by weight status, 39.6% of boys versus 6.5% of girls who are considered normal weight by BMI report attempts to gain weight (Figure 1). Over half of girls (51.9%) versus 16.7% of boys who are classified as normal weight report attempts to lose weight (Table 2). A quarter (24.3%) of adolescent males who have normal weight status by BMI perceive themselves to be underweight. Over half of adolescent males who are overweight by BMI perceive themselves to be about the right weight. Overweight (12.8%) and obese (10.6%) adolescent boys report attempts to gain weight.

Logistic regression analyses demonstrated that odds of weight gain attempts were 1.89 (95% confidence interval [CI] 1.50–2.38) times higher for Black/African American and 1.62 (95% CI 1.16–2.26) times higher for multiple race adolescent boys compared to White adolescent boys in adjusted analyses (Table 3). Identifying as bisexual (AOR 0.47, 95% CI 0.25 – 0.88) was associated with lower odds of weight gain attempts compared to identifying as heterosexual in adjusted analyses (Table 3).

## Discussion

We find that nearly a third of adolescent boys in a nationally representative sample report attempting to gain weight. This includes nearly 40% of adolescent boys who would objectively be considered to be a normal weight by BMI, and extends to 11% of boys objectively considered overweight or obese. Alongside these attempts for weight gain, findings also illustrate inaccuracies in adolescent boys' perception of their own weight; over half of males who would objectively be considered overweight by BMI consider themselves to be "about the right weight."

The high proportion of adolescent males in the US attempting to gain weight may reflect a trend wherein media portrayals of the ideal male body have become larger and more muscular, including, for example, in action figures<sup>17</sup> and fitness magazines.<sup>18</sup> Our nationally representative estimate of 30% of adolescent boys attempting to gain weight is similar to a previously reported US estimate<sup>11</sup> but higher than an estimate from Irish adolescent boys.<sup>10</sup> These differences indicate that social context, even among Western societies, may lead to different weight related attempts among adolescent boys. While these studies all used similar measures for weight gain attempts, future research could clarify what precisely is meant by "trying to gain weight" (gaining muscle mass versus weight in general) and what specific behaviors adolescent boys are using for weight gain attempts (i.e. weightlifting, supplements, consuming more protein, anabolic-androgenic steroids).<sup>19,20</sup>

In addition, we found a high degree of weight misperception among adolescent boys. American adolescent boys perceive themselves to be smaller than objective measures. These findings are consistent with a previous study that found that adolescent boys tended to underestimate while girls tended to overestimate their weight.<sup>21</sup> We also found that Black/African American and multiracial adolescent boys had higher odds of weight gain attempts compared to White adolescent boys. Previous studies have found that Black adolescent males were more likely to have discordant weight perception than White adolescent males.<sup>21</sup> We found that bisexual adolescent males had lower odds of weight gain attempts compared to heterosexual adolescent males. Sexual minority adolescent boys, in contrast to heterosexual adolescent boys, may be more likely to overestimate their weight.<sup>12</sup>

One previous study found that among adolescent boys attempting to gain weight, most were in the healthy (69%) or overweight/obese (27%) weight status, suggesting that these weight gain attempts were medically unnecessary and could lead to overweight.<sup>11</sup> These findings suggest that (i) weight gain attempts extend to males beyond a healthy weight, and (ii) a discrepancy between actual versus perceived weight may be implicated in weight gain attempts.

Limitations of the study include a 60% response rate, which may limit generalizability; however, these findings are consistent with prior estimates in a smaller sample.<sup>19</sup> Given the cross-sectional nature of this study, we are unable to make causal inferences and there is the possibility of unmeasured confounders. Height and weight were based on self-report; the sensitivity of self-reported measures to classify weight status as obese was 81.9% compared to objective measures among Texas high school students, who tended to overestimate height

but underestimate weight, leading to an underestimation of BMI.<sup>22</sup> Although there are limitations in the use of BMI<sup>23</sup>, it is currently the standard by which obesity is defined and measured in primary care.<sup>13</sup> Future research should investigate if weight gain attempts are associated with actual weight gain, and if weight gain in the form of muscle building confers the same health risks as general weight gain.<sup>24</sup>

Understanding adolescent boys' perceptions of their own weight and weight-gain attempts may be important to address in adolescent obesity interventions, and physicians should carefully screen for weight gain attempts in adolescent boys. Interventions to address obesity may need to consider the notion that attempts to gain weight may be common among many adolescent boys, including those who are considered normal weight, overweight, or obese.

## Conclusion

Nearly a third of adolescent boys in this nationally representative sample reported attempts to gain weight, including 40% of those considered normal weight by BMI. Consideration of the unique nature of male body image ought to be integrated into primary care efforts to address weight and obesity in boys. Future research should investigate the medical risks of specific weight gain behaviors in adolescent boys.

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## Abbreviations:

<b>BMI</b>	body mass index
<b>CDC</b>	US Centers for Disease Control and Prevention

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### **Implications and Contribution**

In this nationally representative study of US adolescents, 30% of boys reported a desire to gain weight, including 40% of boys who are considered normal weight by body mass index. Interventions to address adolescent obesity should consider that nearly a third of adolescent boys desire to gain weight.

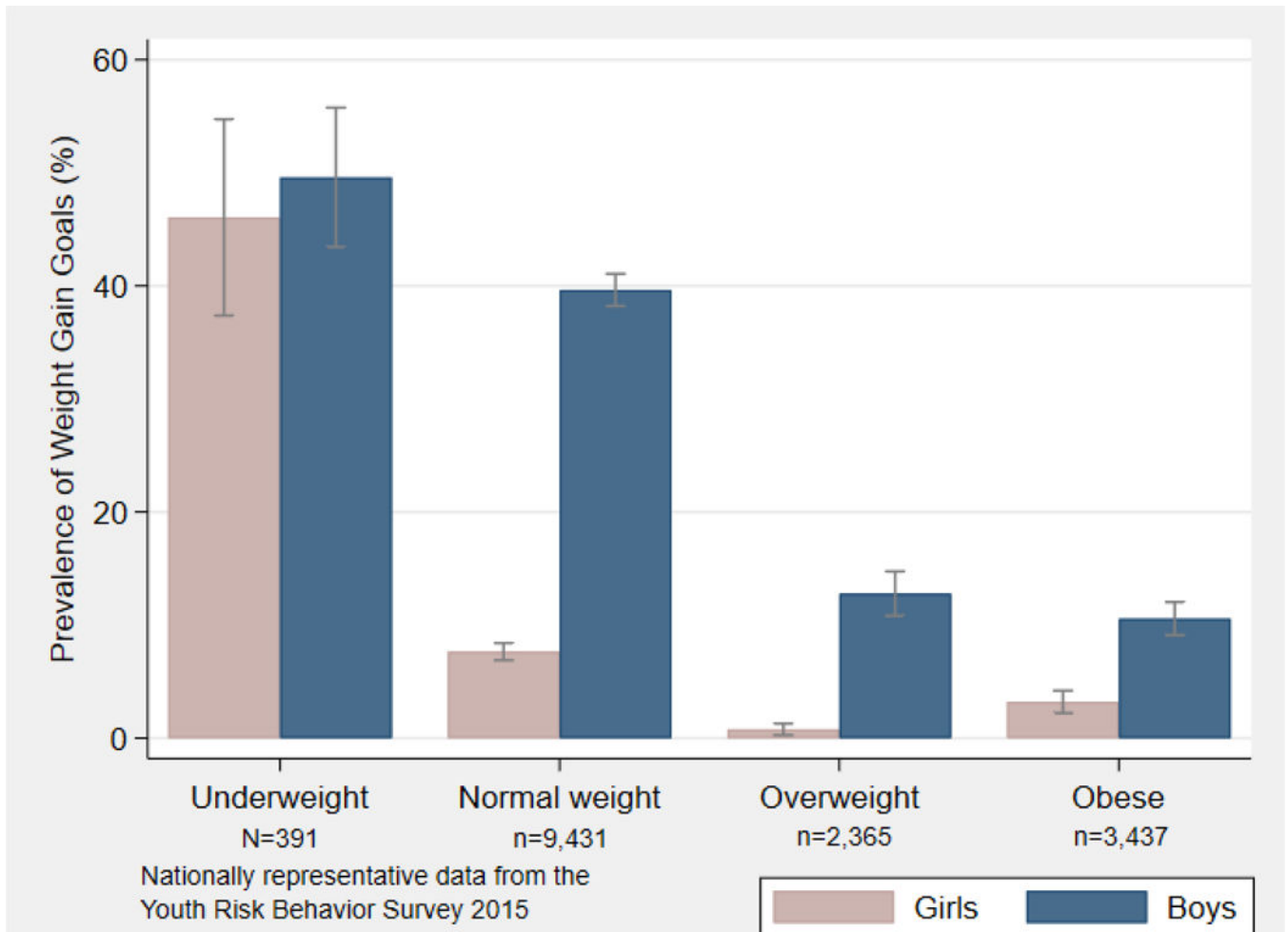
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**Figure 1.** Weight gain attempts among adolescents in the United States, by sex and weight status.

**Table 1.**

Weight status and goals in the Youth Risk Behavior Survey, 2015

	<b>Males</b>	<b>Females</b>	<b>P</b>
<b>N</b>	<b>7,749</b>	<b>7,757</b>	
Age s(mean ± standard error)	16.10 ±0.03	16.02 ± 0.03	<0.001
Race/ethnicity			0.221
White	53.6%	55.5%	
Hispanic/Latino	22.2%	22.4%	
Black or African American	14.1%	13.1%	
Asian/Pacific Islander	5.1%	3.7%	
American Indian/Native American	0.7%	0.5%	
Multiracial	4.3%	4.9%	
Sexual identity			<0.001
Heterosexual (straight)	93.1%	84.5%	
Gay or lesbian	2.0%	2.0%	
Bisexual	2.4%	9.8%	
Not sure	2.6%	3.7%	
Weight status			<0.001
Underweight (BMI < 5th percentile)	3.3%	1.8%	
Normal weight (5th < BMI < 85th percentile)	60.0%	65.6%	
Overweight (85th < BMI < 95th percentile)	14.5%	15.4%	
Obese (BMI >95th percentile)	22.5%	17.3%	
Perception of weight			<0.001
Underweight	19.3%	9.6%	
About the right weight	55.5%	52.3%	
Overweight	25.3%	38.2%	
Weight goals			<0.001
Gain weight	29.6%	6.5%	
Same weight	39.0%	32.9%	
Lose weight	31.4%	60.9%	

**Table 2.**

Weight attempts and weight perception in US adolescents by current weight status

	Weight status							
	Underweight		Normal weight		Overweight		Obese	
	Male	Female	Male	Female	Male	Female	Male	Female
	s	s	s	s	s	s	s	s
N	248	143	4,498	4,933	1,148	1,217	1,855	1,464
Weight attempt								
Same weight	45.3%	37.2%	43.7%	40.5%**	35.4%	17.2%***	27.8%	17.2%***
Lose weight	5.2%	16.7%***	16.7%	51.9%***	51.8%	82.0%***	61.6%	79.6%***
Gain weight	49.6%	46.1%	39.6%	7.7%***	12.8%	0.8%***	10.6%	3.2%***
Perception of weight								
Underweight	76.0%	62.0%**	24.3%	11.1%***	2.2%	2.0%	8.2%	4.9%***
About the right weight	21.0%	34.9%**	67.8%	66.2%	54.6%	26.1%***	28.0%	23.2%**
Overweight	3.1%	3.1%	7.9%	22.7%***	43.3%	71.9%***	63.8%	71.9%***

\*  
p<0.05\*\*  
p<0.01\*\*\*  
p<0.001

**Table 3.**

Logistic regression analysis for sociodemographic variables associated with odds of weight gain attempts among males in the Youth Risk Behavior Survey, 2015

N	Odds ratio (95% CI)	P	Adjusted odds ratio (95% CI) <sup>a</sup>	P
Age	1.07(1.01 – 1.13)	0.033	1.06(1.00– 1.13)	0.070
Race/ethnicity				
White	1.00 (referent)		1.00 (referent)	
Hispanic/Latino	0.91 (0.74–1.11)	0.351	1.00 (0.82– 1.23)	0.971
Black or African American	1.63 (1.30–2.06)	<0.001	1.89 (1.50 –2.38)	<0.001
Asian/Pacific Islander	0.89(0.70 – 1.15)	0.363	0.92 (0.70– 1.22)	0.57
American Indian/Native American	0.90(0.36–2.27)	0.825	0.91 (0.34–2.40)	0.839
Multiracial	1.34(1.00 – 1.81)	0.053	1.62(1.16–2.26)	0.006
Sexual identity				
Heterosexual (straight)	1.00 (referent)		1.00 (referent)	
Gay or lesbian	0.72(0.31 – 1.69)	0.444	0.72 (0.28 – 1.87)	0.497
Bisexual	0.49(0.28 –0.88)	0.019	0.47 (0.25 – 0.88)	0.018
Not sure	0.50(0.24– 1.05)	0.066	0.50 (0.22– 1.13)	0.095
Weight status				
Underweight (BMI < 5th percentile)	1.00 (referent)		1.00 (referent)	
Normal weight (5th < BMI < 85th percentile)	0.67 (0.48 – 0.93)	0.019	0.66 (0.46 – 0.94)	0.024
Overweight (85th < BMI < 95th percentile)	0.15 (0.09–0.25)	<0.001	0.14 (0.86–0.24)	<0.001
Obese (BMI >95th percentile)	0.12(0.08–0.19)	<0.001	0.11 (0.08–0.17)	<0.001

CI = confidence interval

<sup>a</sup> analyses adjusted for age, race/ethnicity, sexual identity, and weight status