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Adolescent Suicidal Behavior Across the Excess Weight Status Spectrum

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Abstract

The present study examined relative suicidal behavioral risks (ideation, attempts) for overweight, obese, and extremely obese adolescents (vs. healthy weight) and who did/did not accurately perceive themselves as overweight utilizing cross-sectional data from the publicly available Youth Risk Behavior Survey (YRBS). A new variable (weight status/accuracy) was computed that combined actual weight status (based on BMI) with weight perception accuracy. To evaluate the effect of weight status/accuracy on each suicidal risk behavior, logistic regression was performed to calculate odds-ratios and 95% confidence intervals (CI). Potential model covariates included gender, age, race, survey year, and whether they had felt sad/hopeless. Weight perception accuracy increased as the degree of excess weight increased. Relative to healthy weight, being obese or extremely obese (but not overweight) was associated with significantly greater risk for adolescent engagement in suicidal ideation, but was unrelated to suicide attempts. Adolescents in all excess weight categories who were accurate in their weight perception were at significantly greater odds of suicidal ideation, whereas those who were inaccurate of no greater odds of suicidal ideation than healthy weight youth who accurately perceived their weight. Findings regarding suicide attempts varied based on actual weight/weight perception accuracy and race/ethnicity. The present findings are both important and clinically relevant. While widely accepted that there are multiple pathways to suicide, our understanding of adolescent suicidal behavior risks and accordingly, prevention efforts, will be informed by comprehensive prospective studies that should also, from here forward, consider categorization of the entire weight spectrum (e.g., extreme obesity).

INTRODUCTION

As the third leading cause of death among adolescents in the United States, suicide is considered a critical public health problem for today's youth.¹ Adolescence is a period of rapid change in physical, psychosocial, educational and vocational domains, also

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distinguished by an increase in behaviors considered to be risky, harmful, or even antisocial.² Not surprisingly, adolescence is a developmental period known for increased risk for the first onset of nonfatal suicidal behaviors, with noteworthy lifetime prevalences of suicidal ideation (19.8-24%) and attempts (3.1-8.8%) for this age group.³ It is widely accepted that there are multiple pathways to adolescent suicide, with a myriad of known contributing factors (e.g., previous nonfatal attempts, depression, peer victimization, family history of suicide, peer suicidal behaviors, impulsivity, substance use, childhood trauma) to guide prevention initiatives.³ However, current evidence remains equivocal regarding whether being overweight or obese increases an adolescent's suicidal behavior risk.

The aim of the present study, to understand whether adolescent excess weight status is associated with suicidal behaviors, proves critical and timely for a number of reasons. First, adolescent overweight and obesity are also public health priorities, given their high prevalence, related health and psychosocial consequences, and likelihood of persistence into adulthood. Only recently have adolescents with extreme obesity (BMI 99th percentile) emerged as their own unique excess weight sub-group in the pediatric literature, representing an alarming 3-6% of today's teenagers^{4,5}. Second, adolescents who are obese, and in particular, those with extreme obesity, while not necessarily depressed,⁶ report some of the greatest impairments in health-related quality of life (HRQOL) relative to other pediatric chronic health conditions and across domains (physical functioning/discomfort, social, emotional, body-esteem).^{7,8} Moreover, it is well established that overweight and obese youth also experience peer difficulties, including victimization⁹ which are known risk factors for higher rates of suicidal ideation and attempts.¹⁰ Third, a recent review of the extant adult obesity literature¹¹, which is largely based on retrospective reviews of "cause of death" records, suggests equivocal evidence supporting increased prevalence of completed suicides for obese adults, albeit leaning towards a positive association. Finally, the recent finding by Windover and colleagues¹² demonstrating that adult bariatric surgery candidates (i.e., extreme obesity) report rates of previous suicide attempts 73 times greater than population norms is disturbing.

With these "facts" in mind, we hypothesized that suicide behavior risks (ideation, attempts) would be greater for adolescents across the excess weight status spectrum (e.g., overweight, obese, extremely obese) relative to youth of healthy weight. However, we could not ignore the interesting findings within the broader pediatric literature that suggest adolescent perception of weight (perceiving oneself as being underweight or overweight) as being more predictive of suicidal behaviors than an adolescent's actual weight status.¹³⁻¹⁶ This proves critical to the present aims given weight misperception is remarkably common in adolescents who are overweight/obese, with recent estimates suggesting 1 in 3 do not consider themselves to be "overweight".¹⁷ However, rates of weight misperception in adolescents whose obesity has progressed to extreme levels remains unknown.

Accordingly, the present study advances the literature by examining relative suicidal behavioral risks (ideation, attempts) for adolescents across the excess weight status spectrum (overweight, obese, extremely obese vs. healthy weight) and who do or do not accurately perceive themselves as overweight. We hypothesized that those youth who carried excess weight and perceived themselves to be overweight would report greater suicidal ideation and

attempts than healthy weight youth who perceived their weight accurately. To achieve our aims, we used cross-sectional data from the publically accessible Youth Risk Behavior Survey (YRBS), which provides what is considered the “most comprehensive epidemiological data on suicide ideation and attempts” for youth in the United States.¹⁸ Given known links between depressive symptoms and suicide risk, analyses controlled for “feelings of sadness/hopelessness”. Potential interactions with demographic variables were also considered.

METHODS AND PROCEDURES

Study Design and Study Population

The YRBS is a biennial school-based survey administered by the Centers for Disease Control and Prevention (CDC) to a nationally representative sample of students who attend public and private schools and are enrolled in grades 9-12. YRBS methods and sampling procedures are described in greater detail elsewhere.¹⁹ Briefly, students providing assent who had parental and school consent for participation independently completed a battery of YRBS self-report forms in a classroom setting, with the guidance of a trained research staff person. The present study utilized a subsample (see Weight Status section below) from the pooled 2007 and 2009 surveys (Total N=28,240). The overall response rate (school response rate × participant response rate) was 68% in 2007 and 71% in 2009.

Outcome Variables

Suicidal Ideation and Suicide Attempts—Suicidal ideation was measured by the survey question which asked adolescents “during the past 12 months, did you ever seriously consider attempting suicide?”, with response options either “yes” or “no”. Suicide attempt was represented by the question “during the past 12 months, how many times did you actually attempt suicide?” and collapsing the response choices (0, 1, 2-3, 4-5, or 6 or more times) to a dichotomous variable 0 versus 1 or more times. Convergent and discriminant validity of these items have recently been established,¹⁸ with endorsement of the continued use of these specific items endorsed by the CDC and others for estimating teen suicidality.

Independent Variables

Actual Weight status—Metric conversion of self-reported height and weight were used to calculate Body Mass Index (BMI: kg/m²). Age, sex, and BMI were used to calculate BMI percentiles using 2000 CDC Growth Charts²⁰ and were categorized as follows: healthy weight (5th–84th percentile, n=19,053, 67.5% of total sample), overweight (85th–94th percentile, n=4,669; 16.5% of total sample), obese (95th–98th percentile, n=3,005, 10.7% of total sample) and extremely obese (99th percentile, n=802; 2.8% of total sample). The validity of the YRBS self-reported height and weight questions (“How tall are you without your shoes on?”, “How much do you weigh without your shoes on?”) has been established given their high correlations with measured values.²¹ Given the aims of the study were to understand suicidal risks associated with excess weight status, YRBS participants who were underweight (<5th percentile, n=711, 2.5% of total sample) were excluded from the present analyses, resulting in a final study N of 27,529 adolescents. Of note, prior to public release of the YRBS databases, BMI values less than 13 (11 for those 11-12 years of age) or greater

than 55 (considered “biologically implausible values” based on CDC criteria) were coded as missing, and accordingly, these participants were not available/included.

Weight Perception Accuracy—Self-perception of weight was measured by asking the question, “how do you describe your weight?” Response options included “very overweight”, “slightly overweight”, “about the right weight”, “slightly underweight”, and “very underweight”. Response options were collapsed into two categories (accurate vs. inaccurate weight perception) based on the following criteria for excess and healthy weight status groups. Consistent with Edwards and colleagues¹⁷, overweight, obese, and extremely obese participants were categorized as accurate weight perceivers if they described their weight as “slightly” or “very” overweight, while inaccurate weight perceivers were those who endorsed “about the right weight” or “slightly” or “very” underweight. For healthy weight youth, accurate weight perceivers endorsed they were “about the right weight”, while inaccurate weight perceivers were those who endorsed they were “slightly” or “very” overweight or underweight.

Adolescent Demographics—Race was assessed by the following survey questions: (1) “What is your race?”, with race classifications including Alaskan Native, Asian, black or African American (non-Hispanic), Hispanic or Latino, Native Hawaiian or other Pacific Islander, white (non-Hispanic), multiple Hispanic or multiple non-Hispanic. For the present study, only non-Hispanic White, non-Hispanic Black, and Hispanic youth were reported. Age groups were defined as: 14, 15, 16, 17, 18 years. Also included in analyses was participant cohort year (2007 or 2009), and gender.

Sadness/Hopelessness—Sadness/hopelessness was measured by the survey question which asked adolescents “have you felt so sad/hopeless during the last 12 months for two weeks or more in a row that you stopped doing some usual activities”, with response options either “yes” or “no”.

Statistical Analyses

SAS v9.3 was used to complete analyses using weighted data to adjust for non-response and oversampling of Black and Hispanic students¹⁹, accounting for the complex survey design. A new variable (weight status/accuracy) was computed that combined actual weight status (based on BMI) with weight perception accuracy. To evaluate the effect of weight status/accuracy on each suicidal risk behavior, logistic regression was performed to calculate odds-ratios and 95% confidence intervals (CI) (SAS Proc SurveyLogistic). Potential model covariates included gender, age, race, survey year, and sadness/hopelessness. All significant ($p < 0.05$) covariates were retained in the final models. Interactions of weight status/accuracy with demographic variables (e.g., gender, race, age) and feelings of sadness/hopelessness were examined. The Institutional Review Board at Cincinnati Children’s Hospital Medical Center approved these secondary analyses.

RESULTS

Weight Status and Weight Perception Accuracy

Actual weight status prevalence of overweight (16.5%), obese (10.7%), and extreme obesity (2.8%) was consistent with widely cited national base rates.⁴ The frequencies for weight perception accuracy, gender, and race by weight status group are presented in Table 1. The percentage of adolescents whose perception of overweight status was accurate/inaccurate varied by degree of excess weight, race, and gender. Eighty-six percent of adolescents with extreme obesity accurately perceived themselves to be overweight whereas only 77.1% of obese and 54.2% of overweight youth did so. This trend was apparent when taking into account gender and race, although it is notable that a higher percentage of Black adolescents who were overweight were inaccurate in their weight perception as opposed to accurate.

Weight Status Group and Suicidal Ideation and Attempts

The associations between weight status group with suicidal behaviors were examined after adjusting for demographic covariates and feelings of sadness/hopelessness. The odds of suicidal ideation were significantly greater for adolescents who were obese (odds ratio [OR] adj.= 1.31, 95% confidence interval [CI]: 1.11 – 1.55) or extremely obese (OR adj.= 1.81, 95% CI: 1.24 – 2.66) relative to those who were of healthy weight. Adolescents who were overweight (OR adj.= 1.11, 95% CI: 0.98 – 1.26) were similar to healthy weight youth in suicidal ideation risk. The odds of suicide attempts were not significantly greater for any excess weight status group as compared to adolescents of healthy weight ($p = 0.18$).

Suicidal Ideation and Weight Status/Accuracy

Prevalence rates and odds ratios of suicidal ideation when examining weight status/accuracy are presented in Table 2. Adolescents in all excess weight categories who were accurate in their weight perception were at significantly greater odds of suicidal ideation than healthy weight youth who accurately perceived their weight status. Adolescents in all excess weight status groups who were inaccurate in their weight perception were similar to healthy weight youth who accurately perceived their weight status. These findings did not vary based on race, gender, age, data cohort or whether the adolescent had feelings of sadness/hopelessness.

Suicide Attempts and Weight Status/Accuracy

Table 3 lists prevalence rates and odds ratios for suicide attempts when examining weight status/accuracy. Weight status/accuracy was found to significantly vary by race, therefore results were stratified by race. In general, odds of attempts were not significantly elevated among youth with excess weight and accurate weight perception. Black youth who were overweight/accurate and Hispanic youth who were extremely obese/accurate were the exceptions. When weight perception was inaccurate, Black obese youth, and Hispanic overweight and extremely obese youth had significantly higher odds of reporting suicide attempts. Of note, Hispanic, extremely obese/inaccurate youth had a 9-fold greater odds of suicide attempts compared to healthy weight/accurate adolescents.

DISCUSSION

Adolescent obesity as well as teen suicide are leading public health challenges. While adolescent suicide has many known risk factors,³ should adolescent excess weight status and further, recognition of that excess weight by the adolescent, be added to this list? The present study advances the adolescent health literature in several unique ways. First, these results are based on a large nationally representative sample of high school students both in terms of demographics as well as prevalence of excess weight status. Second, for the first time in the adolescent obesity/suicide literature, adolescents who were extremely obese (BMI 99th percentile) were deliberately differentiated from those who were relatively less obese (BMI 95th–98th percentile), or overweight (BMI 85th–94th percentile). Previous studies in this area, the majority of which also utilized YRBS data, did not identify the extreme sub-group¹³⁻¹⁶, did not differentiate those who were obese (BMI 95th percentile) from those who were overweight (BMI 85th – 94th percentile),¹⁴⁻¹⁶ or did not consider the entire excess weight spectrum.²² Finally, recognizing that the previous adolescent suicide literature suggests an adolescent's perception of weight (e.g., overweight, underweight) may play an important role in understanding suicidal risks, we examined accuracy of weight perception in a manner recently presented by Edwards and colleagues¹⁷ utilizing YRBS 2007 data (e.g., whether an adolescent who carries excess weight reports they are “overweight”), given its relative simplicity and potential utility for use in clinical settings.

Our initial analyses examined the most basic questions: are actual excess weight status and suicidal behaviors linked in adolescence? And, what is the prevalence of weight perception accuracy in adolescents with varying levels of excess weight? This first step revealed that, relative to youth of healthy weight, being obese or extremely obese (but not overweight) was associated with significantly greater risk for adolescent engagement in suicidal ideation, though excess weight did not increase the odds of suicide attempts during the same time period. Thus, being obese or when it has progressed to an extreme level is associated with heightened risk of one suicidal behavior but not the other, with risk of attempting suicide no greater than “normative” adolescent risk. This was arguably unexpected, although existing literature demonstrates a suicide risk factor can influence one adolescent suicidal behavior (e.g., attempt) and not the other (e.g., ideation).²³

As expected,¹⁷ these multi-year (2007, 2009) YRBS data document that weight misperception was remarkably common in adolescents with excess weight. Interestingly there was evidence of increasing weight perception accuracy as the degree of excess weight increased. In fact, 4 out of 5 adolescents with extreme obesity acknowledged their “overweight” status.

When actual weight status was placed in the context of whether or not an adolescent with excess weight perceived him/herself to be overweight, findings became less straightforward. With regard to suicidal ideation, an overweight, obese, or extremely obese adolescent (regardless of race, gender, age, or whether they acknowledged feelings of sadness/hopelessness) who understood they were overweight, was at significantly greater risk of reporting suicidal ideation than adolescents of healthy weight (who also accurately perceived their weight). Thus, our findings suggest that for all excess weight status groups

represented in the present analyses (e.g., overweight, obese, extremely obese), it is not actual BMI that is key, but rather, weight perception accuracy that increases risk of adolescent suicidal ideation. In contrast, non-recognition of overweight status for an adolescent with of any level of excess weight indicated more “normative” (e.g., similar to healthy weight/accurate youth) suicidal ideation risk. Perhaps then, it is the subgroup of adolescents who both carry excess weight and acknowledge their overweight status who perceive their weight as particularly burdensome. Indeed, a recent study from a clinically referred sample of younger school-age obese children (BMI 95th percentile; ages 5-11 years) found obese youth who did not perceive themselves as overweight self-reported less impairment in HRQOL as compared to those who understood they were overweight.²⁴

Like suicidal ideation, findings regarding suicide attempts varied based on actual weight/weight perception accuracy, but also race/ethnicity. Two clear patterns emerged relative to the respective healthy weight/accurate comparators of similar race/ethnicity. For White youth, excess weight status/accuracy had no impact on the odds of reporting a suicide attempt. However, extreme obesity was associated with greater risk of suicide attempts for Hispanic youth only and irrespective of weight perception accuracy. While in general, a disproportionately higher prevalence of suicidal behaviors have been reported for Hispanic youth relative to White and Black youth,²⁵ no associations with obese weight status (BMI 95th percentile) have yet to be identified.^{13,16} To our knowledge, these are the first analyses in the literature that isolate adolescents with extreme obesity within race/ethnic groups, revealing a specific weight group engaging in a less prevalent but more lethal suicidal behavior (actual attempt). Given there were no additional discernible patterns to the suicide attempt data, a clear area for future research is the examination of the role of excess weight status and weight perception accuracy within race/ethnicity that considers additional factors beyond those in the present analyses. Echoing the assertion of previous researchers,^{16,26} suicidal behavior risk factors, and risk of attempts in particular, may be culture-specific, with prevention efforts needing to be tailored accordingly.

The present findings are both important and clinically relevant. Adolescents who are overweight or obese comprise a considerable proportion of today’s youth, with those who are extremely obese growing in numbers. Furthermore, adolescents who are obese will likely remain obese, carrying disease burden and risk into young adulthood.²⁷ In addition to more universal prevention efforts to decrease adolescent suicidality (e.g., public education, screening programs, education of physicians, restriction of access to lethal means), adolescents with excess weight may benefit from routine screening for suicidal ideation.²⁸ Furthermore, in this context, assessing an adolescent’s perception of whether they are overweight (e.g., “how would you describe your weight?”) may provide critical additional information. This may prove especially relevant to the clinical population of adolescents who consider and/or progress to undergoing bariatric surgery, given findings from the adult bariatric literature. However, it is important to recognize that while a history of suicide ideation in adolescents is known to predict subsequent ideation, a history of *not acting* on suicidal ideation (e.g., no attempt) is predictive of continuing not to do so.²⁹ Only a history of progression to an attempt is associated with subsequent risk of a nonfatal or fatal suicide attempt in adolescents.^{3,29} With the adolescent bariatric surgery outcome literature in its

infancy, controlled prospective long-term outcome studies with close monitoring of suicidal behaviors as well as other known risk factors for completed suicides (e.g., previous nonfatal attempts, depression, substance use, family history of suicide, childhood trauma, impulsivity, history of self-harm) are critical.

The present findings must be interpreted within the context of several limitations, with consequent directions for future research. First, YRBS adolescent weight and height (i.e., BMI) were self-reported. Previous work has shown YRBS self-report methodology to be highly correlated with measured weight and height values²¹. However, given noted trends that adolescents may underestimate weight and overestimate height, the present data may reflect an underestimation of true BMI and the extent of excess weight in the YRBS sample. Arguably, the present study may also represent an underestimation in weight misperception as well, given weight perception accuracy increased as excess weight status increased. Interestingly however, extant research would suggest that a child or adolescent who carries excess weight does not base their self-perception of their weight status (“Am I overweight or not?”) on just their knowledge (or lack thereof) of their actual height/weight or BMI. Rather, overweight perception accuracy in youth has been shown to be associated with a number of individual and contextual factors including the psychosocial impact of their weight (e.g., weight-related quality of life)²⁴, race³⁰, gender¹⁷ as well as their social environment. For example, overweight and obese youth are more likely to misperceive their weight status if they have parents or school classmates who are also overweight.³¹

Second, the YRBS survey was developed with the specific purpose of monitoring epidemiological trends of a broad array of adolescent health and health-risk behaviors, including the extent of suicidality as public health problem for the Centers for Disease Control and Prevention. We recognize single item criterion measures of suicidality, even with established validity¹⁸, are not full clinical assessments of these behaviors. Furthermore, these data characterize only nonfatal suicidal behaviors and do not reflect the role of weight status in completed suicides in adolescents. Thus, comparison to the findings in the adult obesity literature proves challenging, as with few exceptions^{12,32,33}, those investigating adults have focused on completed suicide as an outcome³⁴⁻³⁷, versus the suicidal risk behaviors that precede the fatal event. Third, the YRBS also lacks an indicator of socioeconomic status (SES), a potential confound given suggested links between SES or proxy variables (e.g., parental education) with obesity prevalence in youth³⁸ and weight status misperception³⁹ and suicide⁴⁰ in adults. Finally, YRBS data is cross-sectional in design and, accordingly, causality cannot be inferred.

We recognize there are a number of additional avenues worthy of further exploration, including weight misperception as it relates to adolescent suicidal behaviors for youth who *do not* carry excess weight. For example, in the present data, adolescents who were of a healthy weight yet who misperceived their weight status (either underweight or overweight) were at greater risk of reporting suicidal ideation, and for White and Black adolescents, greater attempts than their healthy weight counterparts who perceived their weight accurately. Further, we did not include examination of the additional weight category of underweight adolescents (BMI < 5th percentile). Certainly our reported findings and those of others¹³ highlight weight perception accuracy as critical in understanding adolescent suicide

behavior risks. The goals of the present study were deliberately simple in their focus on adolescents with excess weight.

As is evident, not all adolescents of excess weight status or even those at an extreme level will consider or attempt suicide, nor should any adolescent, independent of demographic background or weight status/accuracy, be exempt from monitoring or concern. Adolescent risk pathways for suicidal behaviors will only be understood with the testing of comprehensive adolescent models (e.g., previous nonfatal attempts, depression, peer victimization, family history of suicide, peer suicidal behaviors, impulsivity, substance use, childhood trauma) and with assessments that are more clinically driven (vs. public health surveillance) and utilize prospective designs. Based on the present findings, these future studies would also benefit from use of the actual measurement of height and weight (e.g., weight status), the categorization of the entire excess weight spectrum (e.g., extreme obesity), and the adolescent's weight perception accuracy when they carry excess weight.

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Table 1

Prevalence of Weight Status Group and Weight Perception Accuracy by Gender and Race Among US High School Students (YRBS 2007 and 2009).

	Healthy Weight (n=19,053)	Overweight (n=4669)	Obese (n=3005)	Extremely Obese (n=802)
% Gender and Race within Weight Status Group				
Gender				
Male	49.00	52.75	61.87	80.12
Female	51.00	47.25	31.73	19.88
Race/Ethnicity[†]				
White	63.36	53.15	51.05	51.57
Black	12.94	18.50	19.19	20.88
Hispanic	15.81	20.79	22.36	20.55
% Accurate/Inaccurate Weight Perception within Weight Status Group				
Accurate	69.23	54.20	77.05	86.13
Inaccurate	30.77	45.80	22.95	13.87
Gender				
Male				
Accurate	70.15	40.68	70.92	84.82
Inaccurate	29.85	59.32	29.08	15.18
Female				
Accurate	68.33	69.30	87.00	91.41
Inaccurate	31.67	30.70	13.00	8.59
Race				
White				
Accurate	69.29	59.26	81.77	88.61
Inaccurate	30.71	40.74	18.23	11.39
Black				
Accurate	74.06	34.93	64.58	82.00
Inaccurate	25.94	65.07	35.42	18.00
Hispanic				
Accurate	68.50	56.00	76.75	82.31
Inaccurate	31.50	44.00	23.25	17.69

[†] Only participants whose race/ethnicity was White, Black or Hispanic were included in the present study. Therefore, percentages for race/ethnicity within Weight Status Group do not sum to 100.

Table 2

Prevalence and Odds Ratios (ORs) for Suicidal Ideation by Weight Status/Accuracy of Weight Perception Among US High School Students (YRBS 2007 and 2009).

Seriously Considered Attempting Suicide	%	OR (95% CI)	<i>p</i>
Sex			< 0.0001
Male	10.31	0.67 (0.59-0.76)	
Female	18.11	<REF>	
Race/Ethnicity			0.0024
White	13.54	<REF>	
Black	13.16	0.86 (0.74-0.99)	
Hispanic	15.63	0.91 (0.82-1.02)	
Year			†
2007	14.49		
2009	13.84		
Age Group			0.0037
14	13.42	1.07 (0.90-1.28)	
15	15.17	1.19 (1.06-1.35)	
16	14.32	1.10 (0.96-1.27)	
17	13.93	<REF>	
18	12.60	0.96 (0.80-1.16)	
Feel Sad/Hopeless	36.27		< 0.0001
Weight Status/Accuracy			< 0.0001
Healthy Weight/Accurate	10.10	<REF>	
Healthy Weight/Inaccurate	18.46	1.58 (1.43-1.74)	
Overweight/Accurate	17.35	1.40 (1.16-1.68)	
Overweight/Inaccurate	11.36	1.17 (0.96-1.43)	
Obese/Accurate	17.93	1.65 (1.38-1.97)	
Obese/Inaccurate	10.78	1.13 (0.80-1.60)	
Extremely Obese/Accurate	19.86	2.28 (1.48-3.49)	
Extremely Obese/Inaccurate	9.55	1.13 (0.55-2.30)	

Note: All listed variables were considered for inclusion in the model.

† Not included in final model.

Table 3

Prevalence and Odds Ratios (ORs) for Suicide Attempts by Weight Status/Accuracy of Weight Perception Among White, Black, and Hispanic US High School Students (YRBS 2007 and 2009).

	White				Black				Hispanic			
	%	OR (95% CI)	p	%	OR (95% CI)	p	%	OR (95% CI)	p	%	OR (95% CI)	p
Sex			0.0280			0.0004			< 0.0001			
Male	3.59	0.75 (0.57-0.97)		5.53	0.56 (0.41-0.77)		4.53	0.51 (0.39-0.67)				
Female	7.11	<REF>		10.21	<REF>		10.88	<REF>				
Year			†			†			†			†
2007	5.55			7.79			9.00					
2009	5.06			8.00			7.00					
Age Group			< 0.0001			†			†			†
14	6.23	1.71 (1.23-2.37)		8.17			9.72					
15	6.03	1.50 (1.15-1.96)		7.77			8.86					
16	5.80	1.44 (1.10-1.88)		8.76			8.77					
17	4.61	<REF>		7.33			8.29					
18	3.46	0.86 (0.62-1.20)		7.26			11.31					
Feel Sad/Hopeless	17.35	14.57 (10.76-19.73)	< 0.0001	17.97	5.72 (4.07-8.04)	< 0.0001	20.82	7.86 (6.15-10.03)	< 0.0001			
Weight Status/Accuracy			0.0090			0.0008			0.0007			
Healthy Weight/Accurate	4.06	<REF>		5.32	<REF>		7.07	<REF>				
Healthy Weight/Inaccurate	7.04	1.36 (1.09-1.71)		10.78	1.98 (1.31-2.98)		10.92	1.31 (0.95-1.79)				
Overweight/Accurate	5.78	1.00 (0.76-1.31)		9.95	1.75 (1.22-2.52)		8.95	0.99 (0.68-1.44)				
Overweight/Inaccurate	4.60	1.37 (0.94-1.98)		6.76	1.38 (0.79-2.40)		9.41	1.56 (1.05-2.32)				
Obese/Accurate	6.67	1.37 (0.95-1.99)		9.62	1.74 (0.99-3.03)		8.65	1.19 (0.79-1.80)				
Obese/Inaccurate	4.89	1.62 (0.73-3.57)		12.02	3.24 (1.70-6.19)		5.73	0.79 (0.29-2.12)				
Extremely Obese/Accurate	4.26	0.90 (0.40-2.04)		7.34	1.65 (0.60-4.57)		12.00	2.13 (1.22-3.74)				
Extremely Obese/Inaccurate	3.44	1.46 (0.16-12.96)		1.44	0.34 (0.06-1.95)		27.52	9.03 (2.39-34.07)				

Note: All listed variables were considered for inclusion in the model. Significant interactions by race/ethnicity were identified. Thus, results were stratified by race/ethnicity.

† Not included in final model.