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DISORDERED EATING IN ETHNIC MINORITY ADOLESCENTS WITH OVERWEIGHT

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Abstract

Objective—High rates of disordered eating exist among adolescents with overweight and among ethnic/racial minority adolescents. Given the lack of research examining how eating disorder risk is moderated by both overweight and ethnicity/race, this study aimed to explore interactions between ethnicity/race and overweight status on disordered eating behaviors in a population-based adolescent sample.

Method—Cross-sectional data from adolescents ($n=2,271$; 52% females) of White (23%), Black (34%), Hispanic (20%) and Asian (23%; 82% Hmong) ethnicity/race participating in the EAT 2010 study were used to examine associations between overweight status and disordered eating behaviors across ethnic/racial groups.

Results—Disordered eating behaviors occurred more frequently among adolescents with overweight compared to those without overweight across all ethnic/racial groups. Although some differences in the prevalence of disordered eating were found by ethnicity/race, particularly in girls, no consistent patterns of interaction emerged. Overweight White and Hispanic girls reported the highest risk for dieting, while the highest risk for unhealthy weight control behaviors was among overweight Black girls, and for overeating among overweight White and Asian girls.

Discussion—Within a society in which thinness is highly valued and being overweight is stigmatized, across diverse cultural groups, adolescents with overweight are at risk for disordered eating.

Keywords

Adolescent; weight status; ethnicity/race; disordered eating

A robust body of literature has documented the increased risk for disordered eating conferred by overweight status among adolescents, largely due to widespread social pressure towards thinness and weight stigma.¹⁻³ In particular, higher rates of unhealthy weight control behaviors (ranging from exercise to self-induced vomiting) have been documented among adolescents with overweight as compared to their peers without overweight.^{1,3,4} In addition, higher rates of loss of control eating, that is feeling as if one no longer has control over eating and cannot stop eating, and overeating have been documented among adolescents with overweight as compared to those who are not overweight.³⁻⁶ Overeating and loss of control eating in overweight adolescents is thought to result both from the lapses in dietary restriction, and from negative affect associated with experiences of teasing or stigmatization as a consequence of being overweight.²

Another dimension that has been suggested to confer heightened risk for disordered eating is ethnic minority status. Some studies have shown that ethnic minority adolescents are at higher risk for disordered eating, particularly weight-loss targeted behaviors, compared to their White counterparts.⁷⁻¹⁰ This vulnerability may result from higher levels of stress due to minority status.¹¹ Negative affect resulting from stressful social experiences has been thought to contribute to disordered eating²; thus, stress or stigmatization stemming from ethnic/racial minority status might contribute to eating disorder risk by increasing negative affect which has been associated with higher rates of dieting and binge eating.^{2,12} In addition, it has been suggested that among ethnic/racial minority adolescents, particularly Hmong, and ethnic/racial minority young women, physical appearance is viewed as a source of social capital and a means for social mobility.^{13,14} This perception is also likely to increase risk for engaging in unhealthy weight control behaviors that might be viewed as a means to modify appearance so as to increase social capital. Given the increased risk for disordered eating conferred by both overweight and ethnic/racial minority status separately, ethnic minority youth who are also overweight, might be particularly at risk for disordered eating.

In contrast however to this elevated risk, ethnic/racial variations have been documented in terms of body size ideals and attitudes towards overweight. For example, Black youth across the weight spectrum have described experiencing fewer weight-related concerns, and a preference for larger ideal body sizes compared to their White counterparts.^{4,15-17} In addition, Latina girls have been described as preferring slimmer bodies as compared to Black girls¹¹, and some studies have reported higher rates of body dissatisfaction among Latina adolescent girls as compared to White girls.¹⁸ Acculturation has also been described as playing a role in appearance ideals among Latinas, with conflict between the mainstream U.S. thin-ideal, and the more hourglass traditional Hispanic ideal associated with weight concerns among Hispanic youth.¹⁵ In addition, body ideals among Asian girls have also sometimes been shown to deviate from those of White girls, for example toward a preference for lower heights.¹⁸ Finally, cultural variations exist in perceptions of overweight; for example, it has been suggested that among Black women, definitions of overweight and obesity may vary from those of the predominant health framework, with overweight particularly in children not considered problematic unless accompanied by negative social or physical consequences.¹⁹

The literature is currently mixed, however, regarding racial/ethnic differences in disordered eating such as binge eating. Some studies have documented elevated rates of binge eating in African-American¹⁰ and Hispanic boys²⁰ compared to their White peers, while other studies have not found evidence to support ethnic/racial differences^{20,21}. One explanation for these divergent findings might be differences in developmental trends in binge eating, which have been suggested to vary with race and ethnicity, with rates peaking in early adolescence among African Americans, but increasing during adolescence among White samples.¹⁰ Further explorations of ethnic/racial differences in binge and loss of control eating, in addition to other forms of disordered eating, are warranted.

While a growing body of literature has explored weight status and ethnic status differences in unhealthy weight control behaviors and binge eating, to date, little is known regarding the cumulative risk for disordered eating among ethnic minority adolescents with overweight who therefore present two identified risk factors. This is a critical gap, as identifying the groups at highest risk of developing disordered eating has important implications for targeted prevention and clinical practice, including making content culturally relevant.²² Only two previous studies provide some preliminary data on this topic. One study documented that among adolescents with obesity, parental report of child binge eating was higher among White as compared to African American youth, with rates among Hispanic youth falling in the middle.²³ A second study reported that African American and Hispanic girls with overweight reported lower body esteem compared to their peers without overweight, but not higher levels of disordered eating.²⁴ The current study expands upon the limited extant literature to explore whether the relationship between overweight status and disordered eating differs across racial/ethnic groups. As it is somewhat unclear how different ethnic/racial group membership might protect or put adolescents at risk for disordered eating, thus, specific hypotheses were not made.

Methods

Study design and data collection

Participants were drawn from EAT 2010, which is a population-based study of 2,793 diverse adolescents drawn from 20 public schools in Minneapolis/St-Paul, MN, USA. Participants completed in-class surveys and had height and weight measured in 2009–2010. Procedures, which have been described elsewhere,²⁵ were approved by the University of Minnesota's Institutional Review Board.

Sample

EAT 2010 participants from the four largest ethnic groups in the Minneapolis/St-Paul area were examined: White (23%), Black (34%), Hispanic (20%) and Asian (23%; primarily Hmong: 82%). The analytic sample included those with complete data on weight, height, age, gender, and socioeconomic status (SES) (n=2,271; 1,191 females, 1,080 males). Participants had an average age of 14.6 years (SD=2.0); 62% were from low SES families; and 39% were classified as overweight.

Measures

Dieting (yes/no) was assessed with the question, “How often have you gone on a diet during the last year? By ‘diet’ we mean changing the way you eat so you can lose weight.” Responses ranging from *never* to *I am always dieting* (0–4) were dichotomized into “ever dieted” versus “never dieted.”²⁶ Unhealthy weight control behaviors (yes/no) was assessed as endorsement of engaging in any of the following eight behaviors to lose weight or keep from gaining weight in the past year: a) fasting, b) eating very little food, c) using food substitutes (e.g. e.g. power/special drink), d) skipping meals, e) smoking more cigarettes, f) taking diet pills, g) making myself vomit (throw up), h) using laxatives, or i) using diuretics.²⁶ Both less extreme (e.g. smoking) and more extreme weight control behaviors (e.g. using laxatives) were combined because too few adolescents reported extreme weight control behaviors to examine by ethnicity/race and weight status (e.g., cell sizes < 10). Four components of overeating were assessed: objective overeating, loss of control, binge frequency, and distress.²⁷ These items have adequate concurrent validity (published mean probability of reporting overeating based on both questionnaire and self-monitoring data = 49.5%) and test–retest reliability (present study test–retest agreement = 89%²⁸; published kappa = .58²⁹). Categories were dichotomized into 1= any overeating and 0 = no overeating³⁰. Weight Status was based on measured height and weight. Body mass index (BMI; kg/m²) age- and sex- specific percentiles were calculated using the CDC guidelines,³¹ and adolescents were categorized as overweight (≥ 85th percentile) or non-overweight. Where measurements were missing (n=28; 1%), a randomly imputed value was obtained from the multivariate normal expectation-maximization (EM) algorithm based on self-reported BMI, age, gender, socioeconomic status (SES) and ethnicity/race. Age, gender, ethnicity/race, and SES were self-reported. For ethnicity/race, adolescents were asked if they thought of themselves as: a) White, b) Black or African American, c) Hispanic or Latino, d) Native Hawaiian or other Pacific Islander, e) Asian American, f) American Indian or Native American, or g) other. To allow for comparison across ethnic/racial and weight status groups, only the four largest ethnic/racial groups were examined: White, Black, Hispanic and Asian. Those selecting more than one ethnicity/race were omitted. Five levels of SES (collapsed into: low, middle, and high) were based on the highest educational attainment by either parent as reported by the adolescent.³² When missing, eligibility for public assistance, eligibility for free/reduced-cost school meals, and parental employment status were used to infer SES.

Statistical Analysis

Prevalence of dieting, unhealthy weight control behaviors, and overeating were examined descriptively by ethnicity/race and weight status. Analyses were conducted separately for boys and girls given known gender differences in eating outcomes.⁴ Modified Poisson regression models with robust standard errors³³ were conducted to test global interaction effects between overweight status and ethnicity/race. Both multiplicative (differences in relative risk) and additive (differences in absolute risk) interactions were tested. Results are presented stratified by ethnicity/race as both the relative risk (RR) and 95% confidence intervals (95% CI) and the predicted prevalence and standard error of engaging in each outcome for overweight compared to non-overweight youths. Given the exploratory nature of this analysis, adjustments for multiple comparisons were not made ($p < 0.05$). All models

were adjusted for age and SES, and accounted for clustering of students within schools. Analyses were conducted using STATA v.13.

Results

Disordered eating by overweight status

Adjusting for age and SES, the prevalence, difference in prevalence, and RR of disordered eating behaviors among youth with and without overweight by ethnicity/race are presented in Table 1 (boys) and Table 2 (girls). Across most disordered eating behaviors and ethnic/racial groups, the prevalence of disordered eating was higher for overweight as compared to non-overweight youths. Thus, dieting was reported by 40%–67% of overweight girls as compared to 12%–19% of non-overweight girls. Similarly, the RR of engaging in dieting and unhealthy weight control behaviors was higher for overweight as compared to non-overweight adolescents (RR=1.46 to 3.58).

Disordered eating by ethnicity/race

The prevalence of disordered eating behaviors among youth by ethnicity/race, adjusting for age and SES and weight status is presented in Table 1 (boys) and Table 2 (girls). Among boys, the prevalence of all disordered eating behaviors was highest among Asian boys and lowest among White boys, as compared to other ethnic/racial groups. Thus, for example, among boys, unhealthy weight control behaviors were reported by 42.8% of Asian boys, 33.1% of White boys, 34.7% of Hispanic boys, and 38.5% of Black boys. Similarly, among girls, across all disordered eating behaviors, the prevalence of disordered eating was highest among Asian girls as compared to other ethnic/racial groups. White girls displayed the next highest prevalence of disordered eating behaviors as compared to Black and Hispanic girls. For example, unhealthy weight control behaviors were reported by 67.3% of Asian girls, 46.5% of White girls, 44.8% of Hispanic girls, and 43.1% of Black girls.

Interaction between ethnicity/race and overweight status on disordered eating behaviors

Among boys with overweight, the prevalence of disordered eating was similar across ethnicity/race. A significant weight status by ethnicity/race interaction effect was found for dieting ($p=.01$), suggesting that Asian boys with overweight may be at a particularly high absolute risk. Moreover, the prevalence of dieting among Asian boys with overweight was almost double that observed in White boys with overweight (67% vs. 40%). Interactions did not quite meet statistical significance for overeating ($p=0.06$). However, the prevalence of overeating among Asian boys with overweight was more than double that observed in similar White boys (26% vs. 9%, respectively). The prevalence of overeating was also higher in overweight Black boys compared to White boys (15% vs. 9%).

For girls with overweight, significant interactions were found between ethnicity/race and weight status for the risk of dieting ($p=.001$), engaging in unhealthy weight control behaviors ($p<.001$), and overeating ($p=.03$), although no clear pattern emerged. For example, the RR of dieting was lowest for overweight Asian girls and highest for overweight White and Hispanic girls (1.7 vs. 2.5). The RR of engaging in unhealthy weight control behaviors was also lowest for overweight Asian girls but highest for overweight Black girls (1.5 vs.

2.1). The risk of overeating was highest for overweight White and Asian girls, for whom the prevalence was double that of similar Black and Hispanic girls (32% and 31% vs. 16% and 17%, respectively).

Discussion

This study examined ethnic/racial differences in associations between disordered eating and overweight status for youth after controlling for age and socio-economic status. Overall, the findings provided only limited evidence for ethnic/racial differences in the relationship between disordered eating and adolescent overweight. Our findings add to the literature documenting higher rates of disordered eating among adolescents with overweight as compared to their lean counterparts^{1,2} and further indicate that this risk occurs across adolescents from diverse ethnic/racial backgrounds. Findings suggest a need for increased efforts to recognize adolescents with overweight as presenting a high risk for disordered eating, to improve early identification through educating providers, and for prevention programs that address weight stigma.

Among boys with overweight, limited ethnic differences in rates of dieting emerged, however, Asian boys with overweight seem to report more dieting as compared to other groups with overweight. Similarly, across weight categories, Asian boys reported the highest disordered eating behaviors. Although the literature is inconsistent (and Asian groups are notably diverse, with our participants identifying primarily as Hmong), Asian males may present higher levels of body image concerns and weight-loss behaviors compared to their White peers, and less weight-gain efforts.³⁴ Such suggestions are consistent with our findings, and may point to differences between the Asian and White Western male physiques.³⁵ In this way, it has been suggested that Asian men, who are frequently of smaller build and less muscular as compared to White males, experiencing higher levels of concerns.³⁴ In addition, Hmong Asians have been described as a recent group in the U.S., and that this might perhaps lead to greater engagement in behaviors aiming to change appearance in a quest for social capital.¹⁴ Similarly, Asian girls with overweight reported higher rates of disordered eating than other overweight counterparts, including White girls. Some previous research has suggested that Asian women may have culturally specific appearance ideals such as a smaller and even more slender body, which might account for this finding.¹⁸

Black girls with overweight were at the highest risk for unhealthy weight control behaviors, but were not at any increased risk for overeating, as defined in the current study, compared to Black girls without overweight. This heightened risk for unhealthy weight control behaviors is consistent with previous reports⁸, despite reports of fewer weight concerns among Black girls.⁴ In addition, previous research has suggested that across weight categories, Black girls are less likely to report overeating, including binge eating, compared to their white counterparts.⁴ Our findings, specifically that Black girls with overweight displayed a lower risk of overeating compared to White girls with overweight, are consistent with these reported lower levels of binge eating.⁴ As described previously, some evidence has also suggested that differences in developmental trends in binge eating may exist between ethnic/racial groups, with the highest rates among African Americans found in

early adolescence, but rates increasing over the course adolescence among Caucasian samples.¹⁰ This developmental trend may contribute to explaining our findings of lower risk for overeating among Black youth. In addition, research has suggested that Black girls may tend to display higher energy intakes compared to White youth, regardless of loss of control³⁶, and may not may not describe their experience of overeating as loss of control loss of control related to their overeating³⁷. Thus, cultural representations and understandings of overeating and loss of control may also have contributed to these findings.

Similar to Black girls with overweight, Hispanic girls with overweight were not at any increased risk for overeating, as assessed in the current study, compared to Black girls without overweight. Previous studies have reported that rates of binge eating are similar across Hispanic and White girls¹⁵, or even slightly lower in Hispanic girls.²¹ However, it has also been suggested that binge eating in Hispanic girls is poorly predicted by factors such as body dissatisfaction and stress that are well-established risk factors in other groups.²¹ One explanation that has been put forward for these findings is the role of acculturation¹⁵. In the U.S., Hispanic girls may present a range of levels of acculturation, as well as countries of origin, which might account for the complexity of the factors contributing to the development of disordered eating behaviors in this group.

Our findings have several implications. Firstly, they suggest the usefulness of developing prevention programs for disordered eating that take into account the role of overweight and ethnic/racial minority status. Given the hypothesis that negative affect resulting from stigmatizing and stressful social experiences plays a role in the relationship between both those factors and disordered eating², including content targeting negative affect might prove a useful strategy. In addition, our findings highlight the need to educate providers to improve early identification/treatment. Information highlighting the existing risk for disordered eating among ethnic/racial minority groups across the weight spectrum could be helpful, as could clarifying the potential putative mechanisms for this risk including the role of stress due to acculturation and minority status.^{11,15}

Study strengths and limitations should be considered in interpreting our findings. Study strengths include the large diverse sample, the array of disordered eating behaviors assessed, and objective measurements of height/weight. While inherent to examinations of risk across multiple ethnic/racial groups, multiple comparisons may have increased the risk of spurious findings. In addition, self-reported ethnicity/race constituted a proxy for minority status within a Midwest metropolitan area that is predominantly White. Thus, the groupings examined here may have failed to capture these dimensions adequately. In addition, our ethnic/racial categorization failed to capture some of the complexities of ethnic/racial identity by asking participants to choose between identifying their race or ethnicity, and not accounting for mixed heritages. Relatedly, the Asian group in our sample was predominantly of Hmong descent, which reflects the ethnic composition of the Minneapolis/St-Paul area where the Hmong group represent 1.2% of the population, among the highest rates in the U.S.³⁸, which could result in the Hmong experience not being generalizable to other Asian descent groups. Regarding our outcomes, due to small sample sizes within some ethnic/racial subgroups, we used a broad definition of overeating that included both overeating with or without loss of control, and may have resulted in higher prevalences relative to other

studies using more stringent criteria.³⁹ Finally, other factors that might influence weight including medication use and psychiatric comorbidities were not controlled for.

In conclusion, this study contributes to the sparse literature regarding the joint risk of overweight and racial/ethnic minority status to weight control behaviors. Among adolescents with overweight, rates of disordered eating are disconcertingly and similarly high across ethnic/racial groups. Continued attention to the ways in which we can work toward decreasing the stigma associated with being overweight and unhealthy behaviors among this vulnerable group is warranted.

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Adjusted prevalence and relative risk of engaging in eating disorders for overweight as compared to non-overweight adolescent boys by ethnicity/race.

Table 1

	Dieting (n=1,079)		Unhealthy Weight-control Behaviors (n=1,075)		Overeating (n=1,069)	
	% (SE)	RR (95% CI)	% (SE)	RR (95% CI)	% (SE)	RR (95% CI)
White						
Total (n=273)	24.2 (2.4)		33.1 (2.3)		8.7 (2.3)	
Non-overweight (n=191)	12.0 (1.7)	1.00	18.0 (2.3)	1.00	5.6 (1.7)	1.00
Overweight (n=82)	40.2 (4.8)	3.3 (2.5-4.5)	44.9 (3.6)	2.5 (1.8-3.5)	8.7 (2.6)	1.6 (0.5-4.5)
	=28.2		=26.9		=3.1	
Black						
Total (n=361)	27.2 (2.2)		38.5 (4.4)		10.1 (1.6)	
Non-overweight (n=227)	13.7 (2.3)	1.00	28.9 (4.2)	1.00	10.3 (2.1)	1.00
Overweight (n=134)	47.1 (4.2)	3.4 (2.4-5.0)	53.7 (7.8)	1.9 (1.3-2.7)	10.6 (3.2)	1.0 (0.5-2.3)
	=33.4		=24.8		=0.3	
Hispanic						
Total (n=208)	31.4 (1.9)		34.7 (2.6)		8.8 (2.1)	
Non-overweight (n=108)	19.1 (2.7)	1.00	23.4 (3.7)	1.00	5.6 (1.7)	1.00
Overweight (n=100)	50.3 (6.4)	2.6 (1.7-4.1)	56.0 (5.3)	2.3 (1.6-3.2)	15.3 (3.8)	2.6 (1.4-4.5)
	=31.2		=30.7		=9.0	
Asian						
Total (n=238)	37.4 (2.9)		42.8 (3.3)		16.3 (2.3)	
Non-overweight (n=119)	18.5 (3.7)	1.00	26.1 (3.1)	1.00	10.1 (2.7)	1.00
Overweight (n=119)	67.2 (3.9)	3.6 (2.5-5.3)	69.8 (5.2)	2.6 (2.0-3.5)	25.6 (4.1)	2.5 (1.4-4.4)
	=48.0		=42.5		=15.0	
Ethnicity/Race X Weight Status Interaction						
Multiplicative		p=.62				p=.05
Additive		p=.01				p=.06

Models for each outcome were stratified by ethnicity/race and adjusted for age and socio-economic status; interaction p-value is joint/global p-value from full-model before stratification; bolded relative risks were significant at p<0.05

Adjusted prevalence and relative risk of engaging in eating disorders for overweight as compared to non-overweight adolescent girls by ethnicity/race.

Table 2

	Dieting (n=1,190)		Unhealthy Weight-control Behaviors (n=1,187)		Overeating (n=1,182)	
	% (SE)	RR (95% CI)	% (SE)	RR (95% CI)	% (SE)	RR (95% CI)
White						
Total (n=247)	43.5 (2.5)		46.5 (4.4)		20.0 (3.0)	
Non-overweight (n= 173)	28.4 (3.2)	1.00	34.0 (3.8)	1.00	14.9 (2.2)	1.00
Overweight (n=73)	70.6 (4.9)	2.5 (1.9–3.3)	58.5 (5.6)	1.7 (1.4–2.2)	31.9 (4.4)	2.1 (1.6–2.9)
	=42.1		=24.5		=17.0	
Black						
Total (n=416)	36.2 (2.3)		43.1 (2.5)		14.8 (1.4)	
Non-overweight (n=227)	24.7 (2.0)	1.00	30.3 (3.6)	1.00	14.6 (2.1)	1.00
Overweight (n=189)	55.6 (4.6)	2.3 (1.8–2.8)	64.8 (2.2)	2.1 (1.7–2.6)	16.1 (2.2)	1.1 (0.7–1.7)
	=30.9		=34.5		=1.5	
Hispanic						
Total (n=)	44.5 (2.7)		44.8 (1.8)		12.5 (2.8)	
Non-overweight (n= 144)	28.0 (2.3)	1.00	34.0 (2.4)	1.00	9.7 (1.9)	1.00
Overweight (n=105)	70.6 (6.3)	2.5 (2.0–3.3)	65.5 (5.3)	1.9 (1.5–2.5)	16.9 (4.7)	1.8 (0.9–3.3)
	=42.6		=31.4		=7.2	
Asian						
Total (n=)	65.1 (2.0)		67.3 (3.0)		22.5 (2.7)	
Non-overweight (n=203)	50.5 (2.1)	1.00	56.4 (3.4)	1.00	17.8 (2.8)	1.00
Overweight (n=76)	83.8 (3.7)	1.7 (1.5–1.9)	83.7 (3.1)	1.5 (1.3–1.7)	30.9 (4.2)	1.7 (1.3–2.4)
	=33.3		=27.3		=13.1	
Ethnicity/Race X Weight Status Interaction						
Multiplicative		p=.001		p<.001		p=.11
Additive		p=.08		p=.14		p=.03

Models for each outcome were stratified by ethnicity/race and adjusted for age and socio-economic status; interaction p-value is joint/global p-value from full-model before stratification; bolded relative risks were significant at p<0.05