Structure analysis of the Children's Eating Attitudes Test in overweight and at-risk-for-overweight children and adolescents

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Abstract

Background—In school-based samples of children, the Children's Eating Attitudes Test (ChEAT) has a four-factor structure; however, previous studies have not examined its factor structure in samples restricted to overweight youth.

Methods—The ChEAT was administered to 220 overweight (BMI≥95th percentile) and 45 at-risk for overweight (BMI 85th - <95th percentile) children and adolescents. Factors were identified by a principal component analysis with varimax rotation. ChEAT factor scores of children with BMI≥85th percentile were contrasted with those of 152 non-overweight (BMI 5th to <85th percentile) children and adolescents.

Results—Factor analysis generated four subscales described as 'body/weight concern,' 'food preoccupation,' 'dieting,' and 'eating concern.' ChEAT total score, body/weight concern, and dieting subscale scores were positively related to BMI-Z and body fat mass (p's<.05). Compared to non-overweight children, overweight and at-risk for overweight children had higher ChEAT total (9.9 ±7.4 vs. 6.6±7.8, p<.001), body/weight concern (3.2±3.1 vs. 1.3±3.0, p<.001), and dieting (1.8±2.2 vs. .8±2.3, p<.001) subscale scores.

Conclusions—The previously-elucidated factor structure of the ChEAT was primarily supported in a sample of overweight children. The emergence of separate body/weight concern and dieting subscales may relate to these children's experiences with attempted weight reduction.

Keywords

obesity; child; eating behaviors; methodology; eating attitudes

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INTRODUCTION

Disturbed eating attitudes and behaviors are more common among overweight than healthy weight youth (Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002; Tanofsky-Kraff et al., 2004). The increased prevalence of overweight among youth (Ogden et al., 2006), and findings that disordered eating patterns, including binge eating and self-reported dieting, prospectively predict excessive weight and fat gain among children and adolescents (Field et al., 2003; Stice, Cameron, Killen, Hayward, & Taylor, 1999; Stice, Presnell, & Spangler, 2002; Tanofsky-Kraff et al., 2006), underscore the importance of identifying measures that assess eating pathology in overweight youth.

Although the structured clinical interview is considered the optimal approach for assessment of individuals with eating disordered pathology (Bryant-Waugh, Cooper, Taylor, & Lask, 1996; Wilfley, Schwartz, Spurrell, & Fairburn, 1997), questionnaire methodology is often employed because of its brief, economical (Garner, 2002), and easily administered (Kashubeck-West, Mintz, & Saunders, 2001) format that allows data to be collected from large samples. Another potential advantage is that questionnaire methodology may be less susceptible to interviewer bias because it does not require interviewer/participant interaction (Garner, 2002).

A commonly used, brief, self-report questionnaire to assess disordered eating attitudes among children is the Children's Eating Attitude Test (ChEAT) (Maloney, McGuire, & Daniels, 1988). Examinations of the psychometric properties of the ChEAT in previous studies have found good internal consistency, with Cronbach's alpha values in the range of .71–.87 (Maloney, McGuire, & Daniels, 1988; Sancho, Asorey, Arija, & Canals, 2005; Smolak & Levine, 1994) and adequate to good test-retest reliability, with reliability correlations ranging between .56–.81 (Maloney, McGuire, & Daniels, 1988; Sancho, Asorey, Arija, & Canals, 2005). Concurrent validity has been established in that ChEAT scores have significant, positive correlations with weight management behavior (r=.36, p<.001), and body dissatisfaction (r=. 39, p<.001) (Smolak & Levine, 1994) and have significant negative correlations with subscales from the Body Areas Satisfaction Scale that measure satisfaction with distinct body areas or aspects (Cash, 1997; Sancho, Asorey, Arija, & Canals, 2005)

Four separate studies of unselected school-aged children have performed exploratory factor-analyses of the ChEAT, each of which reported the emergence of four factors. In a sample of 308 sixth through eighth grade girls, four factors collectively explained 52.1% of variance (Smolak & Levine, 1994). A Catalan adapted version of the ChEAT in a Spanish sample of 1336 fifth and sixth grade boys and girls also reported four factors which, taken together, explained 49.4% of variance (Sancho, Asorey, Arija, & Canals, 2005). In a third study, separate subscales were determined for boys and girls in 228 second through fourth graders (Kelly, Ricciardelli, & Clarke, 1999). Results of a later factor analysis among 225 fifth through eighth grade girls generally supported Kelly's findings for girls (Ambrosi-Randic & Pokrajac-Bulian, 2005). A commonality among previous factor analyses is the emergence of factors related to dieting, food preoccupation, restricting/purging, and oral control, the latter of which is also referred to as social pressure to eat. In a later study of second through sixth grade participants, Anton et al. (Anton et al., 2006) conducted both exploratory and confirmatory factor analyses to identify six ChEAT factors, three of which generated sufficient internal consistency using a Cronbach's alpha cutoff of .70. Although children within this sample were not overweight, the fact that they elected to participate in a two year obesity prevention trial may have rendered these children more health conscious and/or having a heightened concern about the risk of becoming overweight than other children their age. Despite variation in the factor labels, emergent subscales on each of these factor analyses reflect similar groupings of ChEAT items. Findings from two additional studies using solely confirmatory factor analysis in school-based

samples have generally supported the commonalities noted among previous factor analyses of the ChEAT (Lynch & Eppers-Reynolds, 2005; Sinton & Birch, 2005)

Research on the relationship between total ChEAT scores and BMI among children is inconclusive. Several studies have found higher ChEAT scores among heavier children (McVey, Tweed, & Blackmore, 2004; Morgan, Tanofsky-Kraff, Wilfley, & Yanovski, 2002; Rolland, Farnill, & Griffiths, 1997). However, the only prospective study that examined the relationship between overall ChEAT score and fat gain over time among a sample of children (6–12y) at risk for adult obesity, found no effect of ChEAT score on subsequent fat gain (Tanofsky-Kraff, et al., 2006). To our knowledge, no study has examined the relationship between potential ChEAT subscale scores and BMI, among normal weight or overweight children.

Thus, the objective of the current study was to examine the factor structure of the ChEAT in overweight youth, and to determine whether the identified factors were meaningful in terms of their relationships with body weight and fat mass. We hypothesized that the factor structure elucidated by previous analyses would be upheld in a sample of overweight and at-risk for overweight participants, and that the factors identified would be positively correlated with children's body mass index (BMI; kg/m^2) and total body fat mass.

2. METHODS

2.1 Subjects

Children and adolescents, age 6–18y, were recruited through newspaper advertisements and mailings to families and physicians for studies of the physiological, metabolic, and molecular bases of childhood obesity. Participants were recruited as healthy volunteers (Anon, 1994) for investigations of the natural history of weight gain (Anon, 1996) and for weight reduction trials involving medication (Anon, 2005a, 2005b). According to the CDC recommendation (Ogden et al., 2002), a BMI between the 5th through 85th percentile is considered normal weight. All but thirteen children in the non-overweight group had a BMI between the 15th and 85th percentile. Children whose BMI percentiles were lower than the 15th percentile did not differ on any demographic variable from the rest of the non-overweight children, except there were significantly more girls in this subset (Fisher's exact p<.01), however inclusion of these children did not alter analyses. At-risk for overweight children between the BMI 85th - <95th percentile, and overweight children (BMI≥95th percentile) were also studied. Inclusion and exclusion criteria have been previously described for treatment-seeking (McDuffie et al., 2002) and non-treatment-seeking (Tanofsky-Kraff, et al., 2004). These studies were approved by the National Institute of Child Health and Human Development Institutional Review Board. Each child provided written assent, and a parent gave written consent, for protocol participation.

2.2 Measures

All measures were completed during an outpatient clinic visit to the NIH. Treatment-seeking participants completed all questionnaires prior to initiation of any treatment. For all children aged seven and younger, and in cases where children had difficulty reading or understanding the questions, trained research assistants read the questions aloud and provided simple alternative definitions for words and statements that were not understood.

The Children's Eating Attitudes Test (ChEAT) is a 26-item measure that examines eating and dieting attitudes and behaviors. Example questions include, "I am terrified of being overweight," "I eat diet foods," and, "I stay away from foods with sugar in them." Children are asked to rate the frequency of each attitude or behavior on a 6-item Likert scale, with

answers to each question ranging from 'Never' (1) through 'Always' (6). The ChEAT was modified from the original adult Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) that examines adults' and adolescents' eating attitudes and behaviors, with several items adapted to make the measure more easily understood by children. Validity testing of the ChEAT confirms recoding scores such that the least three symptomatic answers (never, rarely, sometimes) are recoded as 0, with often=1, usually=2, and the most symptomatic score, always, coded as 3 (Maloney, McGuire, & Daniels, 1988). Thus, the total ChEAT score may range from 0–78.

The Three-Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985), is a 51-item questionnaire designed to assess three dimensions of human eating behavior: restraint, disinhibition, and hunger. The TFEQ is a validated measure that has demonstrated stable test-retest reliability (Bond, McDowell, & Wilkinson, 2001). To assess general depressive symptoms, children completed the Children's Depression Inventory (CDI; Kovacs, 1992), a validated 27-item measure that assesses depressive symptomatology in children. Internal consistency for the CDI has been demonstrated to fall in the range of .70–.86 for the overall measure (Kovacs, 1985). Anxiety was assessed via the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, Edwards, Lushene, Montuori, & Platzek, 1973), a 40-item self-report measure of immediate and general anxiety. The STAIC was developed for use with elementary school children, and both forms were shown to have good internal consistency with Cronbach's alpha values between .78–.87, for both boys and girls. Children's parents completed the Child Behavior Checklist for ages 4–18 (CBCL; Achenbach & Elderbrock, 1991), an empirically derived measure with excellent norms that assesses a range of internalizing and externalizing behavioral symptoms and which yields age-appropriate T-scores for each of these scales. The CBCL has demonstrated sufficient reliability and internal consistency.

Children's heights were measured three times to the nearest millimeter by a calibrated electronic stadiometer (Holtain, Crymych, Wales), and weights were measured to the nearest 0.1 kg by a calibrated digital scale (Scale-Tronix, Wheaton, IL). Body weight and the average of three heights were used to calculate BMI. BMI standard deviation scores (BMI-Z) were calculated according to the Centers for Disease Control and Prevention 2000 formula for boys and girls. Body fat mass was measured by dual energy x-ray absorptiometry (DXA; Hologic QDR2000 or QDR4500A, Bedford, MA), according to the manufacturer's instructions and procedures as previously described (Ellis, Shypailo, Pratt, & Pond, 1993; Robotham et al., 2006).

2.3 Statistical Analysis

All analyses were conducted using SPSS for Windows, 12.0 (SPSS, Inc., Chicago, IL). The first analysis performed was to determine the factor structure of the ChEAT in the 265 overweight and at-risk for overweight children who completed the questionnaire. All 26 ChEAT items were subjected to a principal component analysis with a varimax rotation. We used a factor loading cutoff of .4, consistent with previous studies' use of .3 and .4 as factor loading cutoffs (Kelly, Ricciardelli, & Clarke, 1999; Sancho, Asorey, Arija, & Canals, 2005; Smolak & Levine, 1994). In addition, a loading cutoff of .4 generated clear subscale themes. Internal consistency was examined for emergent subscales as a measure of reliability using item-total correlations. Cronbach's alphas are reported. Convergent and discriminant validity were examined by conducting bivariate and partial correlations, controlling for BMI-Z, to compare ChEAT subscale scores with the TFEQ scales and CDI, STAIC, and CBCL, respectively.

Post-hoc multiple regression analyses were then used to examine relationships between ChEAT total scores and subscale scores derived from the factor analysis, and both BMI-Z and body

fat mass, among the entire sample of overweight and non-overweight children. Covariates considered in the regression models were sex, race, age, height, socioeconomic status, and treatment-seeking status. Race was coded as either Caucasian or non-Caucasian; the latter group included African American, Hispanic, and youth of other race/ethnicity. Insignificant covariates were subsequently removed from the models. Analyses of covariance, accounting for the contribution of age, sex, and race were used to compare overweight and non-overweight children's ChEAT total and subscale scores. Associations and differences were considered significant when p values were ≤ 0.05.

3. RESULTS

A total of 220 (52.7%) overweight (BMI $\geq$ 95th percentile), 45 (10.8%) at-risk for overweight (BMI 85th - <95th percentile), and 152 (36.5%) non-overweight (BMI 5th to <85th percentile) children and adolescents, with average age 10.8 ± 3.1 y, participated in the study (Table 1). Twenty-nine percent of the overweight group was seeking weight loss treatment and the rest were participating in non-intervention studies. Overweight children were slightly older (p<. 001) and, as expected, had significantly higher BMI-Z (p<.001) and percent body fat (p<.001). Overweight children also reported significantly higher socioeconomic status scores (2.4±1.4 vs. 2.8±.1.3, p=.01) indicative of lower parental income and education level, and greater ChEAT total scores (6.6±7.8 vs. 9.9±7.4, p<.001), than non-overweight youth. Mean ChEAT score for girls (9.6) was significantly higher than the mean score for boys (7.5; p=.01).

3.1 Factor Analysis among Overweight Sample

A principal component analysis with varimax rotation was performed using responses to the ChEAT from overweight and at-risk for overweight (n=265) children and adolescents. Eight components with Eigenvalues > 1.00 collectively accounted for 58.2% of variance. A factor loading cutoff of 0.4 produced 6 constructs that contained at least three items, four of which demonstrated clear themes. The four subscales were labeled as 'body/weight concern,' 'food preoccupation,' 'dieting,' and 'eating concern,' which collectively explained 33.3% of variance (Table 2).

The 'body/weight concern' subscale, which explained 9.1 % of variance, included items related to body concern and dissatisfaction, and contained the following individual items: "I think a lot about wanting to be thinner," "I think about burning up energy (calories) when I exercise," "I think a lot about having fat on my body," and "I am scared about being overweight." The 'food preoccupation,' subscale aligned with previously described 'food preoccupation' subscales, identifying excessive thoughts of food and eating including, "I think about food a lot of the time," "I have gone on eating binges where I feel that I might not be able to stop," and "I give too much time and thought to food." The food preoccupation subscale explained 9.2% of variance. The 'dieting' subscale (8.0% of variance) identified dieting behaviors including "I am aware of the energy content in foods that I eat," "I try to stay away from foods such as breads, potatoes and rice," "I cut my food into small pieces," "I eat diet foods," and "I have been dieting." Finally, the present study's 'eating concern' subscale, which explained 7.1% of variance, contained the items "I stay away from eating when I am hungry," "I feel that others would like me to eat more," and "I feel that others pressure me to eat."

3.2 Reliability Analysis

Adequate internal consistency was demonstrated for ChEAT total score (Cronbach's α = .78), and the body/weight concern subscale (Cronbach's α = .74), but the food preoccupation, dieting, and eating concern subscales were less consistent (Cronbach's alphas = .66, .55, and . 52, respectively).

3.3 Psychometric properties of the ChEAT among overweight youth

3.3.1 Convergent Validity—ChEAT total score was significantly related to the disinhibition (β=.25, p<.01) and hunger (β=.28, p<.01) subscales of the TFEQ. Furthermore, ChEAT subscales were correlated with respective subscales of the TFEQ: the ChEAT dieting subscale was significantly related to the TFEQ restraint scale (β=.34, p=<.001), and the food preoccupation subscale was significantly related to both disinhibition (β=.30, p=.001) and hunger (β=.35, p=<.001). Due to lack of respective subscales, body weight concern and oral control were not analyzed for concurrent validity.

3.3.2 Discriminant Validity—ChEAT total score was significantly related to total CDI scores (β =.33, p<.01), and CBCL internalizing (β =.20, p=.04), and externalizing (β =.23, p=. 02) t-scores, and trait anxiety β =.38, p<.01). The body weight concern, but not dieting, subscale, was also associated with depressive symptoms (β=.28, p<.01) and trait anxiety (β=. 44, p<.01).

3.4 Relationships between ChEAT total and subscale scores and BMI-Z and body fat

Among the entire sample of overweight, at-risk for overweight, and normal weight children and adolescents, multivariate regression analyses accounting for demographic and anthropometric variables found that the ChEAT total score, and the body/weight concern and dieting subscales, were significantly related to both BMI-Z (β's=.28, .34, .27, respectively, all p's <.001), and total body fat mass (β's=.31 .35, .31, respectively, all p's<.001) (Fig 1A-D). Children's food preoccupation (p=.54) and eating concern (p=.16) subscale scores were neither related to BMI-Z nor total body fat mass (p's=.28, .19, respectively). In analyses restricted to the cohort of overweight and at-risk for overweight children and adolescents, and accounting for demographic and anthropometric variables that contributed significantly to the models, children's BMI-Z were positively related to the ChEAT total score (β=.27, p<.001), as well as the body/weight concern (β=.24, p=.001), dieting (β=.19, p=.02), and food preoccupation (β=.16, p=.02) subscales, but were unrelated to the eating concern subscale (p=.07). For this cohort, ChEAT total score (β=.29, p<.01), and the body/weight concern (β=.29, p<.01) and dieting (β=.22, p=.03) subscale scores, but neither the food preoccupation (p=.7) nor the eating concern (p=.07) subscales, were significantly related to total body fat mass.

4. DISCUSSION

The factor structure of the ChEAT questionnaire determined by previous analyses was partially supported in a sample of overweight and at-risk for overweight children, with similar factors explaining approximately 20% less variance than prior studies demonstrated. Because our primary interest was to explore ChEAT constructs that are potentially more meaningful that the total score for overweight children, we focused on the four factors that demonstrated clear themes, even though this approach limited the total variability explained by the overall measure. In our analysis, both the ChEAT total score and the body/weight concern subscale demonstrated adequate internal consistency and were related to children's BMI-Z and total body fat mass within the entire sample of both overweight and normal weight children. The dieting subscale was also significantly related to both BMI-Z and body fat mass, but failed to demonstrate sufficient internal consistency. Contrary to our expectations, the other ChEAT subscales, food preoccupation and eating concern, were unrelated to body weight and fat mass, and demonstrated poor internal consistency.

Our analysis of the psychometric properties of the ChEAT revealed good convergent validity with the TFEQ and its subscales. The association of both ChEAT total and subscale scores with various measures of general pathology may suggest limited discriminant validity of the measure among an overweight sample. However, such findings may be reflective of an

association between general and eating related pathology, as reported in some other studies (Erickson, Robinson, Haydel, & Killen, 2000; Striegel-Moore, 1995; Vander Wal & Thelen, 2000).

ChEAT total scores were significantly related to BMI-Z, supporting previous studies that found higher scores among overweight compared to normal weight children on the ChEAT questionnaire (McVey, Tweed, & Blackmore, 2004; Rolland, Farnill, & Griffiths, 1997), and on other measures of eating pathology (Burrows & Cooper, 2002; Tanofsky-Kraff, et al., 2004; Vander Wal & Thelen, 2000). Similar to previous analyses, ChEAT total scores generated high internal consistency, confirming the total score as a measure to assess disordered eating attitudes among overweight children.

To elucidate relevant factors for children at high risk for becoming overweight and for children who's BMI-Z equaled or exceeded the 85th percentile. These data produced findings that were supportive of, but not identical to, previous studies among unselected samples of school children. The body/weight concern subscale demonstrated considerable overlap with previously named dieting subscales, with the primary difference being that the current study's body/weight concern subscale did not encompass items that assess food restriction, such as, "I stay away from foods with sugar in them," that rendered other analyses' first factor more reminiscent of traditional dieting. Further, unlike some (Kelly, Ricciardelli, & Clarke, 1999; Smolak & Levine, 1994), but not all (Anton, et al., 2006; Sancho, Asorey, Arija, & Canals, 2005), of the previously identified dieting subscales, the current study's dieting subscale did not include items related to body/weight concern. Rather, in our cohort of overweight and at-risk for overweight children, we found that body/weight concern and dieting were separable constructs. Two other studies (Anton, et al., 2006; Sancho, Asorey, Arija, & Canals, 2005), including one conducted in children who were heavier, and possibly predisposed toward gaining excess weight, have found dieting to be a construct distinct from weight concern. We therefore speculate that weight concern and dieting as separable constructs may be characteristic of overweight youth.

There are several potential reasons for the emergence of weight concern and dieting as separable constructs among overweight children. First, overweight children who were not trying to restrict their food intake at the time the questionnaire was completed might appropriately manifest only body/weight concern. Indeed, it is possible that after numerous unsuccessful attempts to restrict food intake, some overweight youth may cease responding to body dissatisfaction by restricting their food intake, despite experiencing concerns with their body weight and shape. Whereas successful weight loss may constitute positive reinforcement for dieting in normal weight or underweight individuals who exhibit disordered eating, it is conceivable that overweight youth, who do not readily lose weight by restricting intake, develop other manifestations of disordered eating in the place of restriction. Bolstering this hypothesis are findings that overweight adolescents who report disordered eating behaviors fail to differ from those who report no such behaviors in terms of their level of dietary restraint, despite having more eating concern, shape concern, and weight concern (Glasofer et al., 2007). The distinction between actual dieting and dietary restraint offers another potential explanation for the emergence of separate subscales for body concern and dieting among overweight youth. Unlike the Eating Disorder Examination (Fairburn & Cooper, 1993), which assesses both attempted and successful dietary restraint, the ChEAT asks children to report actual restrictive behaviors, possibly aligning more closely with genuine dieting than dietary restraint. Thus, unsuccessful dieting, seemingly more common among overweight youth, would not be captured by the ChEAT's questions, and questions that assess actual dieting among an overweight sample would not necessarily co-occur with body/weight concern, rendering separate constructs.

It is notable that the ChEAT total score and body/weight concern subscale were the only constructs that generated sufficient internal consistency and that were significantly correlated with BMI-Z and DXA fat mass. Although the ChEAT total score was not predictive of excessive fat gain in one prospective study (Tanofsky-Kraff et al., 2006), the body weight concern subscale has not been examined in longitudinal studies of weight gain. Among samples of adolescent girls, other measures of "weight concern" (Killen et al., 1994; Killen et al., 1996) and "thin body preoccupation" (McKnight Investigators, 2003) were predictive of the development of full and partial syndrome eating disorders. Whether or not the ChEAT body/weight concern subscale is similarly useful for predicting eating disorder onset and excessive weight gain among overweight youth warrants future investigation.

We speculate that the poor internal consistency we found for the dieting subscale may be a reflection of an unclear concept of dieting among overweight youth. Despite inadequate internal consistency, further exploration of the dieting subscale is justified, because this subscale was significantly correlated with both BMI-Z and fat mass. Poor internal consistency and the lack of relationship with body weight were also found for the food preoccupation and eating concern subscales among overweight youth. These findings may be partially explained by the degree of pathology exemplified by items on these two subscales. For overweight children, items on the food preoccupation and oral control subscales, such as "I have gone on eating binges where I feel that I might not be able to stop," and "I stay away from eating when I am hungry," may be less common than restricting food intake and/or being concerned with one's body weight.

While data suggest that many overweight children express weight concern and report dieting, few report binge eating behaviors and even fewer endorse complete food avoidance (e.g., fasting; Tanofsky-Kraff, Faden, Yanovski, Wilfley, & Yanovski, 2005). Furthermore, items on the 'oral control' subscale, such as "I feel that others would like me to eat more," and, "I feel that others pressure me to eat," may be more reflective of disordered eating among children with restrictive eating disorders (e.g., anorexia nervosa) than overweight children.

Strengths of this study include the large and racially diverse sample. However, one concern that arises from the use of questionnaire methodology in a pediatric sample is that some young children may have had difficulty understanding particular questions. To address this concern, precautions were taken to ensure that children understood the measure by having questions read aloud when there was concern regarding comprehension. Data gathered for children who clearly did not understand one or more questions were excluded from the analysis. It should also be noted that participants of the present investigation were not recruited in a population-based fashion. Families in the studied sample chose to respond to our notices and thus may be more health-conscious than the general population, possibly limiting the external validity of the study.

We conclude that while the subscales generated from school samples are generally supported in overweight children and adolescents, body/weight concern and dieting appear to be separable constructs, and only the total score and body/weight concern and dieting subscales appear to be associated with body weight and adiposity. Future prospective research is required to determine whether or not these newly-developed ChEAT subscale scores are predictive of full-syndrome eating disturbance in samples of overweight children and adolescents.

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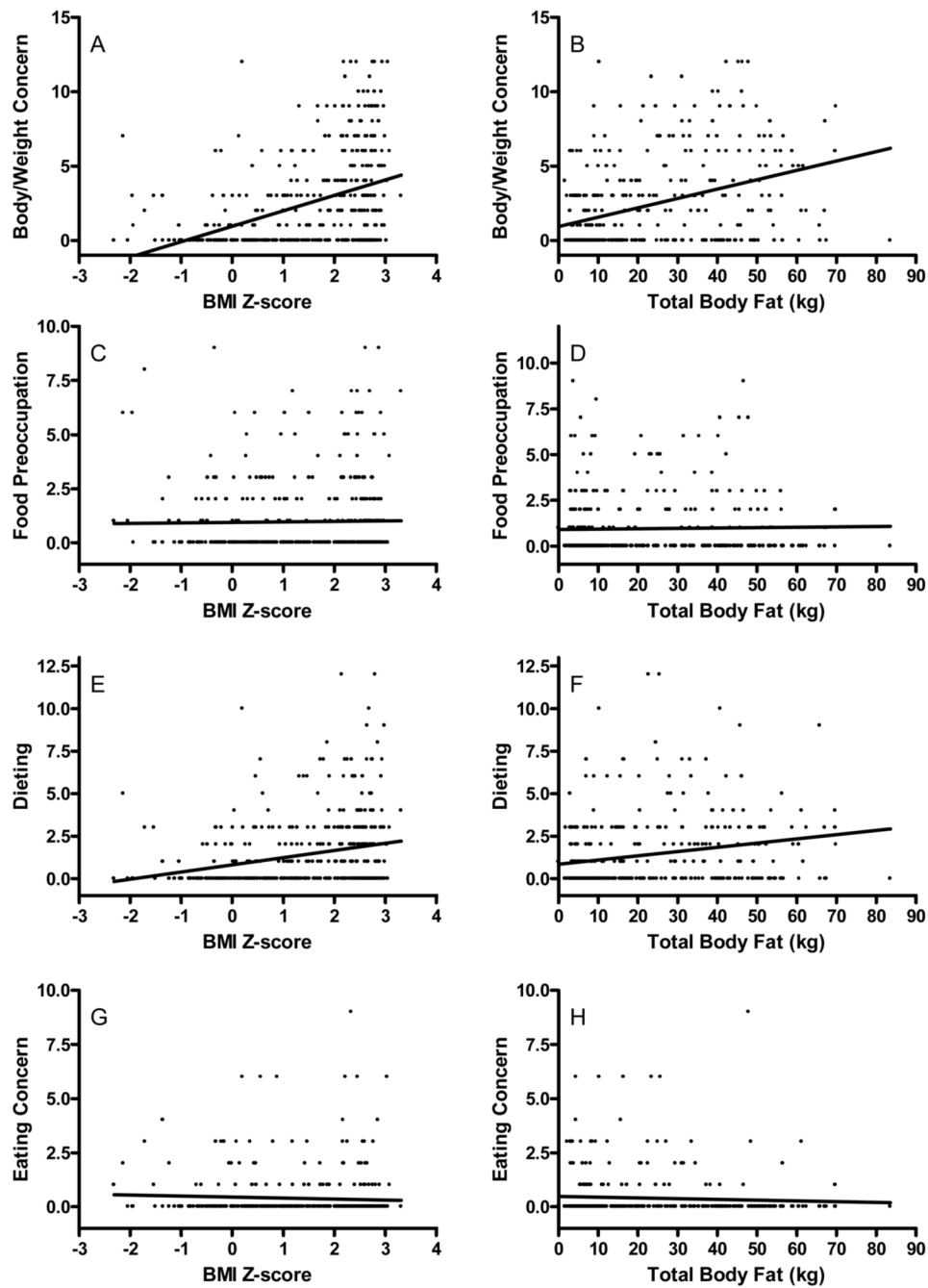
Figure 1.
Associations between body composition and ChEAT subscale scores. A: Body mass index standard deviation score (BMI-Z-score) and ChEAT Body/Weight concern subscale (beta=. 34 p<.001). B: Body fat mass and ChEAT Body/Weight concern subscale (beta=.35, p<.001). C: BMI-Z score and Food Preoccupation subscale (p=.54). D: Body fat mass and Food Preoccupation subscale (p=.28). E: BMI-Z score and Dieting subscale (beta=.27, p<.001). F: Body fat mass and Dieting subscale (beta=.31, p<.001). G: BMI Z-score and Eating Concern subscale (p=.16). H: Body fat mass and Eating Concern Subscale (p=.19)

Table 1

Participant Demographics. Mean ± SD shown unless otherwise indicated.

	Normal Weight (n = 152)	Overweight (n = 220)	Significance
Age (y)	9.6 ± 3.7	11.6 ± 4.5	<.001
Race	30.3% African American	51.3% African American	.09
	61.8% Caucasian	47.2% Caucasian	
	2.0% Hispanic	1.1% Hispanic	
	5.9% other	.4% other	
Sex	49.3% Female	59.6% Female	.10
Socioeconomic status Score	2.4 ± 1.4	2.8 ± 1.3	.01
BMI Z-score	.10 ± .6	2.2 ± .6	<.001
Percent body fat(%)	23.3 ± 10.1	38.9 ± 10.5	<.001
Total ChEAT score	6.6 ± 7.8	9.9 ± 7.4	.03

Table 2

Factor Loadings of the present study

Item	Description	Loading
Factor 1: Body Weight Concern		
1	I am scared about being overweight	.60
11	I think a lot about wanting to be thinner	.79
12	I think about burning up energy (calories) when I exercise	.68
14	I think a lot about having fat on my body	.73
Factor 2: Food Preoccupation		
3	I think about food a lot of the time	.72
4	I have gone on eating binges where I feel that I might not be able to stop	.63
21	I give too much time and thought to food	.62
Factor 3: Dieting		
5	I cut my food into small pieces	.51
6	I am aware of the energy (calorie) content in foods that I eat	.48
7	I try to stay away from foods such as breads, potatoes, and rice	.70
17	I eat diet foods	.71
23	I hav been dieting	.47
Factor 4: Eating Concern		
2	I stay away from eating when I am hungry	.60
8	I feel that others would like me to eat more	.67
15	I take longer than others to eat my meals	.43
20	I feel that others pressure me to eat	.39