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# Depression, Stress and Body Fat are Associated with Binge Eating in a Community Sample of African American and Hispanic Women

**Heather J. Adamus-Leach**[a], **Penny L. Wilson**[a], **Daniel P. O'Connor**[a], **Paula C. Rhode**[b], **Scherezade K. Mama**[a], and **Rebecca E. Lee**[a,*]

[a]Texas Obesity Research Center, Department of Health and Human Performance, University of Houston, 3855 Holman Street, Garrison Gymnasium Rm 104, Houston, TX 77204-6015, United States of America

[b]GME/Internal Medicine Residency Program, BRG-Tulane SOM Satellite Campus, 3600 Florida Boulevard, Baton Rouge, Louisiana 70806, United States of America

## Abstract

**Objective—**The purpose of this study was to examine the relationships among depressive symptoms, stress and severity of binge eating symptoms in a community sample of African American and Hispanic or Latina women.

**Method—**Women (African American *n*=127, Hispanic or Latina *n*=44) completed measures of body composition, stress, depression, and binge eating.

**Results—**Scores on a depressive symptom scale indicated that 24.0% of participants exhibited clinically significant levels of depressive symptoms. Mean binge eating scores were below the threshold for clinically diagnosed binge eating (12.99±7.90). Mean stressful event scores were 25.86±14.26 and the average stress impact score was 78.36±55.43. Linear regression models found that body composition, stress impact score, and being classified as having clinically significant levels of depression, were associated with severity of binge eating symptoms.

**Conclusion—**Higher levels of percent body fat, a CES-D score ≥16 and higher WSI-Impact scores were associated with greater severity of binge eating symptoms.

### Keywords

Binge-Eating Disorder; African Americans; Hispanic Americans; Women; Life Stress; Depressive Symptoms

## Introduction

A considerable disparity exists in overweight and obesity in minority women. The prevalence of overweight and obesity (body mass index [BMI] ≥25 kg/m$^2$) is higher among non-Hispanic African American and Hispanic or Latina women than any other ethnic and gender group in the United States. Among African American women, 78.2% are overweight or obese, and 76.1% of Hispanic or Latina women are overweight or obese compared to 61.2% of non-Hispanic white women (1). The high prevalence of overweight and obesity

*Corresponding author: Rebecca E. Lee, PhD, College of Nursing and Health Innovation, Arizona State University, 500 N. 3rd Street, Phoenix, AZ 85004, United States of America, Phone: 602-496-2644, Fax: 602-496-0886; releephd@yahoo.com.

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among African American and Hispanic or Latina women is linked to an increased risk of cardiovascular disease, Type 2 Diabetes, and some forms of cancer including breast, colon, kidney, and esophageal (2, 3). A recent empirical investigation of the underlying cause for this disparity suggests that energy intake may be the driving force behind this weight gap (4).

Binge Eating Disorder (BED) and binge eating are characterized by overconsumption of large amounts of food and may contribute to difficulties in losing weight and maintaining weight loss (5, 6). People who experience binge eating symptoms have higher BMIs compared to those who do not binge eat (6–11), and as BMI rises, binge eating episodes become more severe (6, 7, 9, 10, 12). Given the higher rates of obesity in minority women and the positive relationship between weight and binge eating symptoms, minority women may be especially vulnerable to the development of BED, or binge eating symptoms may increase their vulnerability to overweight and obesity (10, 13–16). In support of this association, a recent study by Marques and colleagues (2011) found that lifetime prevalence of any binge eating was greater among ethnic minority women compared to white women.

Understanding the underlying causes of binge eating in minority women may help to identify appropriate interventions to reduce the disparity in overweight and obesity. Binge eating is driven by factors other than physical hunger or metabolic need (17). BED and the presence of binge eating symptoms have been linked with depression (13, 18–22). Depressive symptoms are an important predictor of binge eating in women across ethnic groups (13, 23, 24). Fitzgibbon (1998) found the strongest associations between depressive symptoms and BED in Hispanic women, and a study by Mazzeo et al. (2005) found that depressive symptoms were equally associated with BED in Caucasian and African American women (18, 19).

Depressive symptoms are well-established correlates of BED and binge eating in minority women, but the role of stress in BED and binge eating in this group is not well understood. In general, women with eating disorders tended to perceive their lives to be more stressful and have a lower tolerance of stress than those without eating disorders (25–27). Physiologic studies by Gluck et al. (2006 and 2004) provide additional support for this relationship, as they found individuals with BED reported increases in hunger and desire to binge in response to stressful events, and higher levels of cortisol, a physiologic indicator of stress, at baseline or following stressful events (28, 29). Minority groups report discrimination stress as an additional source of stress (30), and in support of a differential relationship between stress and BED based on ethnicity, a study by Harrington and colleagues (2006) reported stronger associations of binge eating and stress in Caucasian women compared to African American women (31). In contrast, when examining the relationship of stress and binge eating in ethnic minority women, a recent study found that stress was not associated with binge eating severity (13).

The underlying psychological mechanisms of binge eating may differ by race or ethnicity and further research is needed to understand the role of stress, and the interaction between stress and depressive symptoms on binge eating symptoms in African American and Hispanic or Latina women. Previous literature has established a link between BMI and binge eating, and in this study we will build on this relationship by including a measure of body fat (BF%). Measures of BF% are more accurate predictors of adiposity than BMI, particularly in minority populations (32–37). Due to the robust, positive correlation between BMI and BF%, we expect a positive correlation between binge eating symptom severity and BF%. In this study we were interested in determining whether a relationship existed between stress and binge eating, and depression and binge eating, independent of BF%.

*Although previous studies have found a positive relationship between depressive symptoms and binge eating symptoms, it is not clear whether a threshold for significant or clinically relevant levels of depression must be met for this relationship to exist.* Therefore, the primary aim of this study was to examine the relationships among *presence of significant* depressive symptoms, stress and binge eating after accounting for BF% in a community-dwelling sample of African American and Hispanic or Latina women. We hypothesized that *having significant levels of depression*, and the interaction of *having significant levels of* depression and *reporting greater* stress *levels* would be positively associated with binge eating symptom severity among women.

## Method

### Study Design

This was a secondary analysis of cross-sectional data from the Health Is Power (HIP; NIH 1R01CA109403) project. HIP was a randomized controlled trial designed to increase physical activity and improve dietary habits among African American and Hispanic or Latina women. Details of the HIP study have been published previously (38–42). The HIP project was approved by the Committee for the Protection of Human Subjects at the University of Houston, and participants provided written informed consent to participate. The investigators certified that all applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed during the investigation.

### Participants

Participants were recruited to HIP from June 2006 through July 2007 via the media, brochures, announcements at churches, information tables at community health fairs, and internet communication. Relevant inclusion criteria included: 1) self-identified as African American or Hispanic or Latina, 2) between the ages of 25 and 60 years, and 3) able to read, speak, and write in English or Spanish. Of the 410 participants enrolled and assessed in the HIP study, 154 women (African American $n$=127, Hispanic or Latina $n$=44) had complete data for the measures of interest and were included in the current study.

### Procedures

Data for the current study were gathered from interviewer-administered questionnaires during the baseline health assessment and self-administered questionnaires provided during a two-week “run-in phase.” Questionnaires on socioeconomic status, demographics, and binge eating were administered by interviewers who read the directions and questions to participants. Participants were provided printed scales and visual representations with corresponding questions for reference during the session with the interviewer. After the baseline health assessment, participants were provided a questionnaire packet to take home, complete, and return at the randomization meeting. The questionnaire packet included paper and pencil measures for depressive symptoms, stressful events and stress impact, and binge eating symptoms.

### Measures

During the baseline health assessment, height was measured using a mobile stadiometer by trained research team members; weight and % BF were calculated using a Tanita Body Fat Analyzer scale (TBF 105, Tanita Corporation of America, Inc., Arlington Heights, IL).

The Center for Epidemiological Studies Depression Scale (CES-D) was used to measure depressive symptoms (43). The CES-D is a self-report questionnaire of 20 items rated on a four-point scale. An overall score is calculated by totaling the scores for each item. A higher score indicates higher levels of depressive symptoms. Scores on the CES-D can be used to

indicate the severity of depressive symptoms. A cut-off score of 16 was used to designate those with a significant, or clinical level of depressive symptomatology. The internal consistency reliability for the CES-D is high (α=.91) (43). These reliability scores were developed from the standardization sample, a sample of headache patients, and a sample of coronary heart disease patients (44). The CES-D has been used in multi-ethnic populations to measure depressive symptoms (21, 45).

The Weekly Stress Inventory (WSI) was used to measure stressful events, and stress impact over the past week (44). The WSI is self-report questionnaire of 87 items. Each item is measured in two ways. First, the participant indicates whether the event occurred within the past week. The total of these items provides the number of stressful events (WSI-Event). A higher score indicates that the participant reported a greater number of stressful events in the past week. Second, if an event occurred in the past week, then the experience of perceived stressfulness of the event is rated on an 8-point Likert-type scale. The total of these items provides the stress impact score (WSI-Impact). Higher WSI-Impact scores indicate that the participant reported experiencing greater amounts of stress over the past week. In a standardization sample, the internal consistency reliability for the WSI-Event alpha coefficients ranged from .92 to .96 and the WSI-Impact alpha coefficients ranged from .93 to .97, and no significant differences were found on sex or race (44).

The Binge Eating Scale (BES) was used to measure binge eating symptom severity. The BES is a self-report questionnaire of 16 items rated on a scale of 0 to 3 (46, 47). For each item, participants are presented with a series of statements and asked to indicate which statement most accurately applies to them. An overall score is calculated by totaling the scores for each item. A higher score indicates a greater binge eating symptom severity.

## Statistical Analyses

Descriptive analyses were conducted to examine the frequency, distribution and normality of each variable. Due to a positively skewed distribution, WSI-Impact scores were exponentially transformed to meet the assumption of normality. No other transformations were required.

Differences between African American and Hispanic or Latina participants were compared for age, median household income, education, BMI, BF%, CES-D, WSI-Impact, and WSI-Event, binge eating symptom severity (BES), BMI and %BF. Independent t-tests were used for all continuous variables. A Chi-square test was used to compare the prevalences of clinically significant levels of depression (CES-D score ≥16) between African American and Hispanic or Latina participants. Person correlation coefficients were used to evaluate bivariate associations among ethnicity, age, median household income, education, BMI, BF %, CES-D, WSI-Impact, and WSI-Event, BES, BMI and %BF.

Sequential (sometimes referred to as blocked) linear regression analysis was conducted to determine associations of depression, stress, and the effect of the interaction of stress and depression on BES. No significant differences by ethnicity were found for WSI scores, prevalence of depression, or BES, so analyses were conducted using the combined data. In the bivariate analyses, only BF% and BMI were correlated with BES. BF% and BMI were strongly associated with one another ($r$=.79), so to avoid multicollinearity only BF% was included as a covariate in the regression model. Bivariate correlations also found that WSI-Event score and WSI-Impact score were highly correlated ($r$=.77). WSI-Impact score cannot increase without an associated event, so to avoid multicollinearity, only WSI-Impact score was included as a predictor of stress in the regression model.

The BES was the dependent variable for the regression analysis. The first block of the regression analysis included only BF% as a predictor to remove its influence. The second block included CES-D as a dichotomous variable (0=score <16, 1=score ≥16), WSI-Impact score, and an interaction term of WSI-Impact and CES-D to evaluate the additional influence of these factors on BES after controlling for BF%.

## Results

### Sample Characteristics

Participant age ranged from 25.0 to 61.0 years (*Mean*=44.6, *SD*=9.2 years), and average BMI was 35.1 (*SD*=7.8). Most African American participants graduated from college (52.0%) and most Hispanic or Latina participants completed some college or junior college (51.2%). The average median household income ranged from $50,000 to 63,000. There were no significant differences in age, median household income, BMI, or BF% between Hispanic or Latina participants and African American participants. African American participants had significantly higher educational attainment than Hispanic or Latina participants [$t(166)=3.57$, $p=<.001$]. All participant characteristic descriptive statistics are displayed in Table 1.

### Depressive Symptomatology

Based on CES-D cut-off score criteria, 23.6% of African American and 25.0% of Hispanic or Latina participants exhibited significant levels of depressive symptomatology. No significant differences were observed in CES-D scores by ethnicity.

### Weekly Stress Inventory Scores

The average number of stressful events reported in the past week (WSI-Event) or the perceived stressfulness of an event (WSI-Impact) did not differ significantly by ethnicity. Average scores for WSI-Event and WSI-Impact scores are shown in Table 1. Higher WSI-Impact scores indicate that the participant reported experiencing greater amounts of stress over the past week.

### Binge Eating

Using the criteria developed by Marcus, Wing, and Hopkins (1988), mean BES scores were not categorized as moderate binge eating or severe binge eating (Table 1). African American and Hispanic or Latina participants did not differ significantly on BES scores.

### Bivariate Associations

Significant correlations were found between WSI-Impact, WSI-Event, CES-D, BMI, BF% and BES ($r=.15–31$, $p<.05$). The number (WSI-Event; $r=.26$) and impact of stressful events (WSI-Impact; $r=.25$) were positively correlated with CES-D ($p<.01$). All bivariate correlations are shown in Table 2.

### Regression Model Predicting Binge Eating Score Severity

The regression model significantly predicted BES [$F(4,169)=9.214$, $p<.001$]. Analyses showed that BF% ($p<.001$), CES-D ($p=.033$) and WSI-Impact ($p=.002$) were associated with BES. The interaction of CES-D and WSI-Impact was not significantly associated with BES. A summary of the relationships described in the regression model is presented in Table 3 and showed that higher levels of BF%, a CES-D score ≥16, and higher WSI-Impact scores were associated with higher scores on the BES.

## Discussion

Understanding the underlying psychosocial mechanisms of binge eating symptom severity among African American and Hispanic or Latina women is important for guiding obesity interventions which may help reduce the prevalence of overweight and obesity in these populations. The purpose of this study was to examine the relationships among depression, stress, and binge eating symptom severity in a community-dwelling sample of African American and Hispanic or Latina women. The results of the associations between depression, binge eating symptom severity, and BF% severity supported our hypothesis. The interaction between stress and depression was not significantly related to binge eating symptom severity, which did not support our hypothesis.

An unexpected finding was that perceived stressfulness of an event (WSI-Impact) was also independently related to binge eating symptom severity. Based on the previous, equivocal findings for the relationship between stress and binge eating in minority populations (13), we did not foresee finding that stress would predict binge eating symptom severity after controlling for BF%. This finding was particularly unexpected since our sample of community dwelling participants did not present in a clinical setting with diagnosed BED. It would have been more likely that having sub-clinical BED symptoms would decrease the chance of detecting an effect than had we also had a large sample of more severe binge eaters, or participants diagnosed with clinical BED. One explanation for this discrepancy could be the measures used in the two studies. Whereas Azarbad and colleagues used a measure of traumatic stress in their study, in the current study, the WSI assessed minor life events, or daily stressors, similar to the scale used by Crowther et al. (2001), who also found that women who engage in binge eating rated daily hassles as more stressful than women who did not binge eat (25). This finding also aligns with the elevated physiologic response to stress (cortisol levels) in obese women with BED, compared to obese women who are not diagnosed with BED (28).

Consistent with previous research in samples of similar races/ethnicities and ages, we found a significant, positive relationship between depressive symptoms and binge eating among African American and Hispanic or Latina women (13, 14, 18, 20). This finding aligns with those of prior studies, including one by Fitzgibbon et al., which found that of the variables entered in a hierarchical regression analysis (age, education, BMI, depression score, and body image score) BMI and depressive symptoms explained 11% and 9%, respectively (18, 19, 45). Fitzgibbon et al. proposed that depression was the most robust of the theorized causal predictors of binge eating (18).

The current study had several strengths, including a sizable, community-based sample of overweight and obese African American and Hispanic or Latina women. Those who are free-living in the community, particularly African American and Hispanic or Latina women, have been understudied compared to treatment-seeking samples. Use of a community-based sample allows inferences to be made to the larger population of African American and Hispanic or Latina women who may not seek treatment. This population has been found to underutilize mental health services compared to Caucasian women seeking treatment for BED, and therefore may be less likely to seek or receive treatment (16). Using this information, additional studies should be conducted to investigate further BED, binge eating, their correlates, and potential treatments in similar samples. A second strength of this study was the participants' ages. The mean age of participants in the present study was 45 years with wide variability (*SD*=9.2 years). Most of the previous research in this area has focused on younger, college-aged populations (9, 12, 21, 23, 48). Recent research has begun to hint that BED and binge eating behaviors may manifest in middle-aged women (49, 50), as observed in our sample. This may reflect the changing roles of women in the workforce,

and secular trends emphasizing greater independence throughout the lifespan for women. Unintended consequences of these trends may be increases in stress, depressive symptoms, and binge eating that has not previously been documented, and may suggest an important subgroup of the population in need of assistance.

A third strength of the present study was inclusion of both African American and Hispanic or Latina women. A limited amount of prior research includes both races/ethnicities and provides results based on each race/ethnicity. We consider it a strength due to both the higher prevalence rates of BED/binge eating as well as the escalating rates of overweight and obesity in African American and Hispanic or Latina women compared to African American and Hispanic or Latina men. Additional strengths included the use of measured height and weight to calculate BMI, and the CES-D and WSI, that are widely used, well-validated measures of depressive symptoms and stress.

The cross-sectional design, use of a convenience sample and the potential for selection and participation biases may limit generalizability of the current study. From these cross-sectional results we cannot determine causal pathways among binge eating, body fat, stress or depressive symptoms. Although the results suggested a relationship among depressive symptoms, %BF, and BES scores, longitudinal research is needed to understand how changes in any one of these factors would impact the others. Although the sample size in our study was smaller than typical clinical samples of BED patients (13), it was comparable to previous studies which have also examined binge eating in a community sample (8). A larger sample size may have resulted in increased statistical power to detect meaningful differences as statistically significant. Regardless, the lack of previous data, and the strengths of this data set make this work an important contribution to the literature.

The findings from the present study can inform evidence-based clinical practice. As clinicians treat overweight or obese African American and Hispanic or Latina women, discussions should include depressive symptoms, stress, and binge eating behavior. Treatments for binge eating should address depressive symptoms and stressful life events as an underlying cause, and treatment for depressive symptoms in overweight or obese patients may include strategies that address binge eating. If depressive symptoms, high levels of stress, and binge eating symptoms are apparent in an overweight or obese patient, the clinician must develop a holistic approach to treatment of not just the excess weight, but the possible underlying issues leading to the weight gain.

This study found that higher BF%, clinically significant levels of depression, and high ratings of perceived stress (WSI-Impact) were related to greater severity of binge eating symptoms measured by the BES in a community-dwelling sample of African American and Hispanic or Latina women. Findings suggest that the association of binge eating symptoms with overweight and obesity in a community-dwelling sample could mean that addressing binge eating and BED in community-based programs might be a promising venue for addressing overweight and obesity. Future research should examine the impact of treatment for depression, and stress reduction techniques on severity of binge eating symptoms.

## References

1. Flegal KM, et al. Prevalence and trends in obesity among US adults, 1999–2008. JAMA. 2010; 303(3):235–41. [PubMed: 20071471]
2. National Cancer Intitute. Cancer Trends Progress Report, 2009–2010 Update: Prevention. 2011. Available from: http://progressreport.cancer.gov/doc.asp?pid=1&did=2009&mid=vcol&chid=91
3. National Institutes of Health. Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults: The Evidence Report. Obes Res. 1998; 6(Suppl 2):51S–209S. [PubMed: 9813653]

4. Johnston DW, Lee WS. Explaining the female black-white obesity gap: a decomposition analysis of proximal causes. Demography. 2011; 48(4):1429–50. [PubMed: 21948107]
5. Keranen AM, et al. The effect of eating behavior on weight loss and maintenance during a lifestyle intervention. Prev Med. 2009; 49(1):32–8. [PubMed: 19406146]
6. Yanovski SZ, Sebring NG. Recorded food intake of obese women with binge eating disorder before and after weight loss. Int J Eat Disord. 1994; 15(2):135–50. [PubMed: 8173559]
7. Guss JL, et al. Binge size increases with body mass index in women with binge-eating disorder. Obes Res. 2002; 10(10):1021–9. [PubMed: 12376583]
8. Hrabosky JI, Grilo CM. Body image and eating disordered behavior in a community sample of Black and Hispanic women. Eat Behav. 2007; 8(1):106–14. [PubMed: 17174858]
9. Pike KM, et al. A comparison of black and white women with binge eating disorder. Am J Psychiatry. 2001; 158(9):1455–60. [PubMed: 11532731]
10. Striegel-Moore RH, et al. Recurrent binge eating in black American women. Arch Fam Med. 2000; 9(1):83–7. [PubMed: 10664648]
11. Striegel-Moore RH, et al. Comparison of binge eating disorder and bulimia nervosa in a community sample. Int J Eat Disord. 2001; 29(2):157–65. [PubMed: 11429978]
12. Napolitano MA, Himes S. Race, weight, and correlates of binge eating in female college students. Eat Behav. 2011; 12(1):29–36. [PubMed: 21184970]
13. Azarbad L, et al. Psychosocial correlates of binge eating in Hispanic, African American, and Caucasian women presenting for bariatric surgery. Eat Behav. 2010; 11(2):79–84. [PubMed: 20188290]
14. Ivezaj V, et al. The relationship between binge eating and weight status on depression, anxiety, and body image among a diverse college sample: a focus on Bi/Multiracial women. Eat Behav. 2010; 11(1):18–24. [PubMed: 19962116]
15. Lovejoy M. Disturbances in the Social Body; Differences in Body Image and Eating Problems among African American and White Women. Gender & Society. 2001; 15(2):239–261.
16. Marques L, et al. Comparative prevalence, correlates of impairment, and service utilization for eating disorders across US ethnic groups: Implications for reducing ethnic disparities in health care access for eating disorders. Int J Eat Disord. 2011; 44(5):412–20. [PubMed: 20665700]
17. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, DSM-IV. 4. 1994.
18. Fitzgibbon ML, et al. Correlates of binge eating in Hispanic, black, and white women. Int J Eat Disord. 1998; 24(1):43–52. [PubMed: 9589310]
19. Mazzeo SE, Saunders R, Mitchell KS. Binge eating among African American and Caucasian bariatric surgery candidates. Eat Behav. 2005; 6(3):189–96. [PubMed: 15854865]
20. Meneghini LF, Spadola J, Florez H. Prevalence and associations of binge eating disorder in a multiethnic population with type 2 diabetes. Diabetes Care. 2006; 29(12):2760. [PubMed: 17130226]
21. Mitchell KS, Mazzeo SE. Binge eating and psychological distress in ethnically diverse undergraduate men and women. Eat Behav. 2004; 5(2):157–69. [PubMed: 15093785]
22. Pinaquy S, et al. Emotional eating, alexithymia, and binge-eating disorder in obese women. Obes Res. 2003; 11(2):195–201. [PubMed: 12582214]
23. Spoor ST, et al. Relations between dietary restraint, depressive symptoms, and binge eating: A longitudinal study. Int J Eat Disord. 2006; 39(8):700–7. [PubMed: 16941629]
24. Wardle J, Waller J, Rapoport L. Body dissatisfaction and binge eating in obese women: the role of restraint and depression. Obes Res. 2001; 9(12):778–87. [PubMed: 11743062]
25. Crowther JH, et al. The role of daily hassles in binge eating. Int J Eat Disord. 2001; 29(4):449–54. [PubMed: 11285582]
26. Hansel SL, Wittrock DA. Appraisal and coping strategies in stressful situations: a comparison of individuals who binge eat and controls. Int J Eat Disord. 1997; 21(1):89–93. [PubMed: 8986522]
27. Wolff GE, et al. Differences in daily stress, mood, coping, and eating behavior in binge eating and nonbinge eating college women. Addict Behav. 2000; 25(2):205–16. [PubMed: 10795945]

28. Gluck ME. Stress response and binge eating disorder. Appetite. 2006; 46(1):26–30. [PubMed: 16260065]
29. Gluck ME, Geliebter A, Lorence M. Cortisol stress response is positively correlated with central obesity in obese women with binge eating disorder (BED) before and after cognitive-behavioral treatment. Ann N Y Acad Sci. 2004; 1032:202–7. [PubMed: 15677411]
30. Thoits PA. Stress and health: major findings and policy implications. J Health Soc Behav. 2010; 51(Suppl):S41–53. [PubMed: 20943582]
31. Harrington EF, et al. The relationships among trauma, stress, ethnicity, and binge eating. Cultur Divers Ethnic Minor Psychol. 2006; 12(2):212–29. [PubMed: 16719573]
32. Frankenfield DC, et al. Limits of body mass index to detect obesity and predict body composition. Nutrition. 2001; 17(1):26–30. [PubMed: 11165884]
33. Peltz G, et al. The role of fat mass index in determining obesity. Am J Hum Biol. 2010; 22(5):639–47. [PubMed: 20737611]
34. Romero-Corral A, et al. Accuracy of body mass index in diagnosing obesity in the adult general population. Int J Obes (Lond). 2008; 32(6):959–66. [PubMed: 18283284]
35. Okorodudu DO, et al. Diagnostic performance of body mass index to identify obesity as defined by body adiposity: a systematic review and meta-analysis. Int J Obes (Lond). 2010; 34(5):791–9. [PubMed: 20125098]
36. O'Connor DP, et al. Generalized equations for estimating DXA percent fat of diverse young women and men: the TIGER study. Med Sci Sports Exerc. 2010; 42(10):1959–65. [PubMed: 20305578]
37. Lopez Y 3rd, et al. Analysis of body composition methods in a community sample of African American women. Women Health. 2011; 51(8):709–23. [PubMed: 22185287]
38. Kueht ML, McFarlin BK, Lee RE. Severely obese have greater LPS-stimulated TNF-alpha production than normal weight African-American women. Obesity (Silver Spring). 2009; 17(3): 447–51. [PubMed: 19057521]
39. Layne CS, et al. Development of an ecologically valid approach to assess moderate physical activity using accelerometry in community dwelling women of color: a cross-sectional study. Int J Behav Nutr Phys Act. 2011; 8:21. [PubMed: 21439052]
40. Lee RE, et al. Neighborhood and PA: neighborhood factors and physical activity in African American public housing residents. J Phys Act Health. 2011; 8(Suppl 1):S83–90. [PubMed: 21350267]
41. Lee RE, et al. Multiple measures of physical activity, dietary habits and weight status in African American and Hispanic or Latina women. J Community Health. 2011; 36(6):1011–23. [PubMed: 21519867]
42. Lee RE, et al. Health is Power: an ecological, theory-based health intervention for women of color. Contemp Clin Trials. 2011; 32(6):916–23. [PubMed: 21782975]
43. Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement. 1977; 1:385–401.
44. Brantley, PJ.; Jones, GN.; Boudreauz, E. The Weekly Stress Inventory. In: Zalaquett, CP., editor. Evaluating Stress: A Book of Resources. Scarecrow Press; 1997.
45. Johnson F, Wardle J. Dietary restraint, body dissatisfaction, and psychological distress: a prospective analysis. J Abnorm Psychol. 2005; 114(1):119–25. [PubMed: 15709818]
46. Gormally J, et al. The assessment of binge eating severity among obese persons. Addictive Behaviors. 1982; (7):47–55. [PubMed: 7080884]
47. Timmerman GM. Binge Eating Scale: Further Assessment of Validity and Reliability. Journal of Applied Behavioral Research. 1999; 4(1):1–12.
48. Anestis MD, et al. The multifaceted role of distress tolerance in dysregulated eating behaviors. Int J Eat Disord. 2007; 40(8):718–26. [PubMed: 17868125]
49. Striegel-Moore RH, Franko DL. Epidemiology of binge eating disorder. Int J Eat Disord. 2003; 34(Suppl):S19–29. [PubMed: 12900983]
50. Taylor JY, et al. Prevalence of eating disorders among Blacks in the National Survey of American Life. Int J Eat Disord. 2007; 40(Suppl):S10–4. [PubMed: 17879287]

**Table 1**

Participant Characteristics

| | Total (n=171) | African American (AA) (n=127) | Hispanic Latina (n=44) |
|---|---|---|---|
| Age (Mean ± SD) | 45.05(9.25) | 45.77 (9.35) | 42.78 (9.05) |
| Total Family Income (Median) | $57,001–63,000 | $57,001–63,000 | $50,001–57,000 |
| Education (% in Median category) | 46.4 Some College | 52.0 Some College | 51.2 Some College * |
| BMI (Mean ± SD) | 34.96 (7.53) | 34.74 (7.90) | 35.58 (6.39) |
| % Body Fat (Mean ± SD) | 43.41 (6.82) | 43.16 (7.19) | 44.13 (5.61) |
| WSI-Event (Mean ± SD) | 25.86 (14.26) | 26.80 (14.98) | 23.14 (11.68) |
| WSI-Impact (Mean ± SD) | 78.36 (55.43) | 80.83 (57.98) | 71.27 (47.26) |
| CES-D (% score ≥16) | 24.0 | 23.6 | 25.0 |
| BES (Mean ± SD) | 12.99 (7.90) | 12.65 (7.53) | 13.95 (8.90) |

* sig. different from AA at p<.001

**Table 2**

Bivariate Correlations for Binge Eating Score and Predictor Variables

| Measure | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. BES | -- | | | | | | | | | |
| 2. Ethnicity | .072 | -- | | | | | | | | |
| 3. WSI-Sum | .157* | −.113 | -- | | | | | | | |
| 4. WSI-Impact | .234** | −.052 | .768** | -- | | | | | | |
| 5. CES-D | .246** | .014 | .259** | .249** | -- | | | | | |
| 6. Education | −.020 | −.267** | .122 | .117 | −.104 | -- | | | | |
| 7. Income | −.105 | −.004 | −.165* | −.073 | −.015 | .053 | -- | | | |
| 8. Age | −.064 | −.132 | −.278** | −.259** | −.034 | −.056 | .157* | -- | | |
| 9. BMI | .273** | .049 | −.076 | −.020 | .098 | −.133 | −.032 | .105 | -- | |
| 10. %Body Fat | .305** | .062 | −.076 | .010 | .123 | −.094 | −.005 | .217** | .794** | -- |

*Correlation is significant at $p<.05$;

**Correlation is significant at $p<.01$

**Table 3**

Regression analysis for variables associated with severity of binge eating symptoms

| Variable | *B* | SE B | β |
|---|---|---|---|
| Step 1 | | | |
| Constant | −0.21 | 3.75 | |
| Body Fat | 0.35 | 0.09 | .30*** |
| Step 2 | | | |
| Constant | −10.1 | 4.51 | |
| Body Fat | 0.31 | 0.08 | .27*** |
| CES-D | 13.3 | 6.20 | .73* |
| WSI Impact | 3.13 | 1.01 | .26** |
| WSI Impact X CES-D | −3.42 | 2.03 | −.59 |

$R^2$=.09 for Step 1; $\Delta R^2$=.09 for Step 2 (ps<.001).

*<.05,

**<.01,

**<.001.