



# Gender and racial/ethnic differences in binge eating symptoms in a nationally representative sample of adolescents in the United States



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## ABSTRACT

**Objective:** Binge eating disorder (BED) is the most prevalent eating disorder in the U.S. adolescent population. Both BED and subthreshold binge eating disorder (SBED) are associated with physical and mental health problems. Gender and racial/ethnic differences in prevalence of binge eating in a nationally representative sample of adolescents have been reported but have not yet been assessed in relation to individual symptoms of binge eating. We examined gender and racial/ethnic differences in endorsement of eight binge eating symptoms in a nationally representative sample of U.S. adolescents.

**Methods:** We used data from the National Comorbidity Survey-Adolescent Supplement (NCS-A; 2001–2004), a nationally representative cross-sectional study of adolescents aged 13 to 18 years ( $n = 9336$ ). We compared binge eating symptoms across gender and racial/ethnic groups using multivariable regression models.

**Results:** Females endorsed more binge eating symptoms than males associated with loss of control ('eat when not hungry') (adjusted prevalence ratio [aPR] = 1.18, 95% confidence interval [CI] = 1.02, 1.37,  $p = 0.024$ ) and distress (e.g., 'afraid of weight gain while binge eating' [aPR] = 3.29, CI = 2.43, 4.47,  $p < 0.001$ ). Racial/ethnic minorities displayed different patterns of binge eating symptoms than non-Hispanic Whites. Hispanics reported being more 'afraid of weight gain while binge eating' (aPR = 2.05, CI = 1.25, 3.37,  $p = 0.006$ ) than non-Hispanic Blacks.

**Discussion:** Our findings suggest significant gender and racial/ethnic differences in binge eating symptom presentation. Future work should explore reasons for these gender and racial/ethnic differences and consider these differences when determining how best to prevent and treat binge eating in adolescents.

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## 1. Introduction

Adolescence is a critical period of increased vulnerability to eating disorders (Shapiro-Weiss & Shapiro-Weiss, 2001), including binge eating disorder (BED) (Swanson et al., 2011). BED, a new diagnosis in DSM5 (American Psychiatric Association, 2013), is characterized as recurrent consumption of unusually large quantities of food (i.e., overeating) with a sense of loss of control and marked distress. BED is associated with obesity (Marcus & Wildes, 2013; Neumark-Sztainer et al., 2007; Stankovic & Potenza, 2010) and comorbid with almost all major psychiatric disorders (Fairburn et al., 1998; Hudson et al., 2007; Swanson et al., 2011). BED is the most prevalent eating disorder among adolescents in the U.S. general population (1.6%) (Swanson et al., 2011). In contrast to adults, however, it may be difficult to differentiate adolescent binge eating from eating a large

amount of food due to developmentally-appropriate growth spurts. Youth may also report fewer episodes of binge eating than are required to meet diagnostic criteria for BED, resulting in lower prevalence of full threshold BED in children and adolescents as compared with adults (Tanofsky-Kraff, 2008). Subthreshold binge eating disorder (SBED), characterized as recurrent overeating with a sense of loss of control that does not meet full BED diagnostic criteria, is an important problem in its own right, as it is associated with negative mental and physical health outcomes, including future development of BED (Sonneville et al., 2013; Stice et al., 2009; Swanson et al., 2011; Tanofsky-Kraff et al., 2011).

Swanson and colleagues' study using the National Comorbidity Survey-Adolescent Supplement (NCS-A) dataset showed that lifetime BED prevalence was almost three times as high among female adolescents (2.3%) and as male adolescents (0.8%) (Swanson et al., 2011); lifetime SBED prevalence among adolescents, however, did not differ by gender (female: 2.6%; male: 2.3%) (Swanson et al., 2011). Reasons for this pattern of gender differences in BED versus SBED are not yet well understood. Previous non-epidemiological studies have shown that males and females with binge eating experienced similar clinical impairment (Striegel et al., 2012). Male adults (Striegel-Moore et al., 2009) and adolescents (Lewinsohn et al., 2002) in fact reported more

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overeating than females; however, males were less likely than females to endorse perceived loss of control, one of the symptoms of BED (Lewinsohn et al., 2002; Striegel-Moore et al., 2009). Male adolescents also reported fewer binge eating symptoms related to binge eating-related distress and were less likely to report wanting treatment or having been treated for eating problems (Lewinsohn et al., 2002). Assessing potential gender differences in particular symptoms associated with binge eating may provide more nuanced information to inform our understanding of this pattern of findings, and use of epidemiological data would provide results generalizable to the general U.S. adolescent population.

Research also suggests that prevalence of binge eating behavior may differ by race and ethnicity. Hispanics were found to have higher prevalence of lifetime BED than other racial/ethnic groups, and non-Hispanic Blacks, Hispanics, and other racial/ethnic minority groups showed higher prevalence of SBED than non-Hispanic Whites (Swanson et al., 2011). State-wide surveys of disordered eating behaviors among adolescents showed that Hispanic females most frequently reported binge eating (Croll et al., 2002). A study with a national sample of the U.S. college participants showed that binge eating was the best predictor of distress in non-Hispanic White, African American, and Latino respondents (Franko et al., 2007). Binge eating appears to be a significant issue among racial/ethnic minority adolescents (Croll et al., 2002; French et al., 1997; Elliott et al., 2013; Johnson et al., 2002; Neumark-Sztainer et al., 2002; Field et al., 1997); however no studies, to the authors' knowledge, have investigated racial/ethnic differences in symptoms of binge eating among adolescents or assessed whether gender differences in adolescent binge eating vary by race/ethnicity using nationally representative data. Identifying gender and racial/ethnic differences in binge eating symptoms is an important first step toward understanding the patterns of risk for binge eating and developing gender- and cultural-specific interventions to address binge eating concerns and to reduce potential health disparities.

This study assessed gender and racial/ethnic differences in binge eating symptoms in the general population using data from the NCS-A (Kessler, Avenevoli, Costello, et al., 2009a; Merikangas et al., 2009). We investigated potential disparities by gender and race/ethnicities (non-Hispanic Whites, non-Hispanic Blacks, and Hispanics) with respect to the endorsement of eight binge eating symptoms. Based on past research and Bem's gender schema theory (Bem, 1981) – which highlights the transactional relationship between cultural beliefs about gender and individuals' development and expression of culturally-based expectations regarding males and females from an

early age – we hypothesized that females would endorse more binge eating symptoms associated with loss of control and distress due to binge eating than males. Because gender- or race/ethnicity-specific psychosocial, environmental, and economic factors may play a role in the development and maintenance of problematic eating (George & Franko, 2010) and these factors may be interrelated, we further explored adolescent race/ethnicity (Kelly et al., 2005; Paxton et al., 2006; Perry et al., 2004; Ricciardelli et al., 2007) as a potential moderator of the associations between gender and binge eating symptoms. We examined each binge eating symptom individually to better understand which indicators of loss of control and distress are relevant across gender and racial/ethnic groups to inform treatment and prevention efforts.

## 2. Methods

### 2.1. Study design and participants

The NCS-A is a nationally representative, cross-sectional survey of mental health with a sample of 10,148 adolescents aged 13 to 18 years. Detailed description of the NCS-A's background, measures, and design is provided elsewhere (Kessler et al., 2009a; Kessler, Avenevoli, Green, et al., 2009b; Merikangas et al., 2009). The data include prevalence estimates, correlates, and service use patterns for DSM-IV disorders. We received approval to access the restricted NCS-A data from the Interuniversity Consortium for Political and Social Research and also obtained Johns Hopkins Bloomberg School of Public Health IRB approval for this study.

Because this study focused on possible differences in symptoms across non-Hispanic White, non-Hispanic Black, and Hispanic adolescents, we excluded the heterogeneous 'Other' racial/ethnic category ( $n = 615$ ) from our analysis. We intended to assess symptoms in adolescents with BED or SBED and therefore excluded adolescents who met lifetime criteria for anorexia nervosa (AN:  $n = 34$ ) or bulimia nervosa (BN:  $n = 86$ ) and who reported engaging in recurrent overeating but did not meet the criteria for BED or SBED ( $n = 77$ ). Of the remaining 9336 adolescents, we included 149 (1.60%) who met the criteria for lifetime BED, 256 (2.74%) who met the criteria for lifetime SBED, and 8931 (95.66%) who did not meet the criteria for either.

### 2.2. Measures

The NCS-A utilized a modified version of the World Health Organization Composite International Diagnostic Interview (CIDI) Version 3.0 (Kessler & Üstün, 2004) administered by lay interviewers to ascertain binge eating diagnosis and symptoms among adolescents. The CIDI is a widely used diagnostic instrument that has exhibited good psychometric properties (Green et al., 2012; Kessler et al., 2009b). All items in this study were dichotomous (yes/no) self-reported responses.

The stem question for the BED and SBED assessments in the NCS-A asked whether the respondent had ever engaged in overeating at least twice a week for three months or longer. The NCS-A's definition of SBED differed from most pre-DSM-5 definitions of SBED in the following ways: it specified frequency of binge episodes as being at least twice weekly rather than once and included less stringent requirements for meeting full BED diagnostic criteria (see Appendix A and Appendix B for a detailed description of the NCS-A's BED/SBED diagnostic criteria).

#### 2.2.1. Endorsement of eight symptoms of binge eating disorder

The structured interview in the NCS-A assessed eight binge eating symptoms for all adolescents who endorsed recurrent overeating in the stem question, in order to evaluate whether they met the criteria for BED, SBED, or neither (see Appendix A and Appendix B for the NCS-A's BED/SBED diagnostic criteria). In addition to 'eating much more quickly than usual' as an indicator of a binge eating episode, we assessed four symptoms that indicated a sense of lack of control during the episode of binge eating: 1) eating until feeling uncomfortably full;

**Table 1**  
Sociodemographic characteristics of participants with lifetime BED or SBED in the National Comorbidity Survey: Adolescent Supplement (2001–2004).

Characteristics	Lifetime BED ( $n = 149$ )	Lifetime SBED ( $n = 256$ )	Comparison group <sup>a</sup> ( $n = 8931$ )
Gender (n, %)			
Female	<b>106 (71.14)</b>	118 (46.09)	4514 (50.54)
Male (= ref.)	<b>43 (28.86)</b>	138 (53.91)	4417 (49.46)
Race/ethnicity (n, %)			
Non-Hispanic Black	34 (22.82)	<b>78 (30.47)</b>	1794 (20.09)
Hispanic	34 (22.82)	<b>58 (22.66)</b>	1782 (19.95)
Non-Hispanic White (= ref.)	81 (54.36)	<b>120 (46.88)</b>	5355 (59.96)
Age (mean $\pm$ SD)	15.55 $\pm$ 1.49	15.32 $\pm$ 1.56	15.17 $\pm$ 1.50
Education <sup>b</sup> (mean $\pm$ SD)	9.02 $\pm$ 1.57	8.87 $\pm$ 1.58	8.75 $\pm$ 1.59

BED = binge eating disorder; SBED = subthreshold binge eating disorder; ref. = reference; SD = standard deviation.

Note. Weighted Chi-square tests were conducted to compare sociodemographic characteristics of participants with lifetime BED and SBED to the comparison group. Results in bold font indicate that differences are significant at  $p < 0.05$ .

<sup>a</sup> Adolescents without lifetime AN, BN, BED, SBED, or recurrent overeating.

<sup>b</sup> Missing data on education: lifetime BED ( $n = 1$ ); lifetime SBED ( $n = 3$ ); comparison group ( $n = 26$ ).

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