

Binge-Eating Symptoms, Emotional-Behavioral Problems and Gender Differences among Adolescents: A Brief Report

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Abstract

We investigated relationships between binge-eating symptoms and emotional-behavioral problems in 382 community-adolescents (aged 13-18 years, $M = 15$, $SD = 1$; 61% girls), analyzing gender differences. Few studies have investigated binge eating in community-adolescents and none have explored gender differences in Italy. Participants completed the Binge Eating Scale (BES) and the Youth Self Report (YSR 11/18), which measures internalizing, externalizing and other problems (e.g. binge-drinking, substance abuse). 6% of adolescents (99% girls) were at-risk of binge-eating symptoms. In both gender, binge-eating symptoms were correlated with internalizing and other problems (all $p < .001$), but unexpectedly they were correlated with externalizing problems only in girls. The set of internalizing, externalizing and other problems predicted 23% of variance in BES among girls; only other problems predicted 12% of variance in BES among boys. Results identified gender-specific and non-specific risk factors for binge eating in Italian community-adolescents, that should be further investigated.

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1. Introduction

Binge-eating disorder (BED), which was recognized in the fifth edition of the *Diagnostic and Statistical manual of mental disorders* (DSM-5, 2013; APA, 2013), is one of the most common chronic illnesses among adolescents and young people from Western countries and the prevalence has been increasing (Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). According to DSM-5 a diagnosis of BED requires recurrent episodes of overeating accompanied by psychological distress and a perceived loss of control (LOC), in the absence of the compensatory behaviors typical of bulimia nervosa (BN) (APA, 2013). Although BED is more frequently diagnosed in females, sub-clinical symptoms are more frequently reported by males, suggesting gender differences may be less pronounced in BED than in other eating disorders (EDs). A recent comprehensive review (Marzilli, Cerniglia, & Cimino, 2018) suggested that during adolescence the average prevalence of BED (~1.6%) surpasses that of anorexia

nervosa (0.3%) and BN (0.6%) and ranges from 1-4.6% if individuals reporting sub-threshold symptoms are included.

Binge-eating symptoms during adolescence were associated with concurrent and adult physical and socio-psychological impairments (Allen, Byrne, Oddy, & Crosby, 2013a; Micali et al., 2015; Sonnevile et al., 2013). Specifically, binge eating tends to co-occur with internalizing (i.e. anxiety, depression and somatic complaints), externalizing (i.e. aggressive and delinquent behavior) and other problems, namely social (substance use and binge-drinking), thought (suicidal ideation) and identity-related problems (self-harm and gender-identity problems) (Ballarotto et al., 2017; Laghi, Liga, Baumgartner, & Baiocco, 2012; Sonnevile et al., 2013, Swanson et al., 2011). However, there is no agreement on which of these problems represents the greatest risk factor for BED (Allen, Byrne, Oddy, & Crosby, 2013b; Micali et al., 2015).

Most studies have found similar co-occurrences in girls and boys (Ballarotto et al., 2017; Sierra-Baigrie, Lemos-Giráldez, & Fonseca-Pedrero, 2009), but some have highlighted gender differences (Aimé, Craig, Pepler, Jiang, & Connolly, 2008; Cuzzocrea, Larcán, & Lanzarone, 2012). In boys, binge eating was found to be most likely to co-occur with internalizing and other problems, whereas in girls it tended to be associated just with internalizing ones (Aimé et al., 2008; Allen et al., 2013a; Sonnevile et al., 2013). Binge-eating symptoms increased with age in both genders, but at a faster rate in boys.

Given the negative consequences of binge-eating symptoms in adolescence and the potential existence of gender-specific pathways, community-based research on risk factors may have preventive and clinical utility. However, most studies with adolescents have involved only clinical samples (Ballarotto et al., 2017), while studies on community adolescents were mostly focused on EDs more generally (Aimé et al., 2008; Allen et al., 2013a; Cuzzocrea et al., 2012), and only few examined specifically binge eating (Laghi et al., 2012; Sierra-Baigrie et al., 2009). To the best of our knowledge this is the first Italian study to explore gender differences in rates of binge-eating symptoms and their associations with other emotional-behavioral problems in a non-clinical, adolescent sample.

The study had two main aims:

- (1) To determine the prevalence of binge-eating symptoms in a community sample of adolescents, assuming higher rates in girls, controlling for age.
- (2) To investigate the correlations between adolescents' binge-eating symptoms and their emotional-behavioral problems and to explore possible gender differences. Correlations were expected in both genders, but we hypothesized that, in girls, binge-eating symptoms would be

most strongly associated with internalizing problems whereas in boys they would be more widely associated with internalizing problems and with other problems.

2. Method

2.1 Participants and procedure. 400 volunteer participants were recruited from high-schools in Liguria: 18 were absent at school during the data collection (4,5% attrition) and the final sample comprised 382 adolescents (aged 13-18 years, $M = 15.59$, $SD = 1.1$; 235 girls, 147 boys). They were mostly Italian (96%), with a healthy body mass index (BMI; 70% normal-weight) and living with their married parents with a medium-high educational level (58% had parents with at least a high-school diploma). There were no gender differences in the demographic variables we measured (family structure, parental education, etc.), but BMI was lower in girls ($M = 19.31$, $SD = 3.72$) than boys ($M = 20.9$, $SD = 3.01$; $t = 4.24$, $p = .000$).

All the parents and the adult participants provided written, informed consent before the assessments were administered. The entire procedure was approved by the Research Ethical Committee of the Department of Educational Sciences, University of Genoa, and complied with the ethical standards of the international scientific community. The participants completed questionnaires on one occasion, during school hours.

2.2 Measures

1. An ad hoc socio-demographic questionnaire was used to collect detailed information about participants, including BMI and family information.
2. The Binge Eating Scale (BES; Gormally, Black, Daston, & Rardin, 1982) is a well-known 16-item self-report scale specifically designed to assess binge-eating symptoms; responses are given using a three-point Likert scale. Scores range from 0-46, with three thresholds: < 17 no risk of BED; < 27 moderate binge-eating, suggesting sub-threshold symptoms of BED; > 27 high risk of BED, full clinical assessment or diagnosis is warranted. For the purpose of this study adolescents with scores >17 were classified as being at risk of BED. The BES discriminated effectively between a clinical BED sample and a non-binge eating sample (*effect size* = 1.78) and showed high two-week *test-retest* reliability ($r = .87$).
3. The Youth Self-Report 11/18 (YSR; Achenbach, 2001; Frigerio et al., 2009) is a 112-item self-report questionnaire for subjects aged 11-18 years and measures the level of emotional-behavioral problems over the previous 6 months. Responses are given using a three-point scale (0 = not true, 1 = somewhat or sometimes true, 2 = very or often true). Scores are collected into nine syndrome subscales and further clustered into scores for internalizing

problems (withdrawn, somatic complaints, anxious/depressed), externalizing problems (delinquent and aggressive behaviors) and other problems (social, thought and identity-related problems). The YSR showed good internal validity (*Cronbach's α* : .71-.95) and one-week *test-retest* reliability ($r = .68$).

2.3 Analytic plan

We present prevalence statistic. Mean BES scores of boys and girls were compared using an independent-samples *t*-test, controlling for variance in age. Correlations (Pearson's r) between BES score and the main YSR scales were calculate separately for each gender. Multiple regression was used to explore the extent to which emotional-behavioral problems predicted binge-eating symptoms.

3. Results and discussions

3.1 Prevalence of binge-eating symptoms and gender differences

Overall 6% of community adolescents ($n = 23$) were at risk of BED (i.e. had BES scores > 17) and specifically, 2% ($n = 8$) reported severe symptoms and 4% ($n = 15$) reported moderate symptoms. The BES score was correlated with sex ($r = .23, p = .000$), with higher scores in girls ($M = 7.9, SD = 6.9$) than boys ($M = 4.9, SD = 4.5; t = -5.13, p = .000$). Controlling for age, the BES scores were positively correlated with age only in boys ($r = .182, p = .027$), while no correlation between the BES scores and age was found for girls ($r = .064, p = .325$), as expected.

The average prevalence of binge eating symptoms in our sample was higher than that reported in an international review (1.6%; Marzilli et al., 2018), probably due to the significant gender differences, that confirmed our hypothesis. Indeed, only in girls the prevalence of binge-eating symptoms (5.3%) fall outside the reported international range (1-4.6%), whereas the prevalence in boys (0.7%) was within it (0-1.2%). These results seem to suggest that Italian girls are more vulnerable to binge eating than peers in other countries. The Italian culture may reinforce the importance of the physical appearance in the definition of identity, eliciting insecurity in terms of body image, which is meta-analytically recognized as risk factors for eating disorder in girls (Feingold & Mazzella, 1998), but cross-cultural studies would be needed to confirm this hypothesis. Instead, the boys in our sample did not report high levels of binge-eating symptoms, nor did most report sub-threshold symptoms, partially disconfirming previous studies and maybe reflecting the general tendency of the boys to not consider their large food intakes as bingeing. As consequence, they may underestimate the binge eating symptoms self-reported in a questionnaire, also because it is more common that the boys try to eat more than they need

to put on weight and become "big", chasing the shared male standards for a good body image (Feingold & Mazzella, 1998; Furnham, Badmin, & Sneade, 2002).

3.2 Relationships between binge-eating symptoms and emotional-behavioral problems: gender differences

As expected, we found significant correlations between binge eating and the three types of emotional-behavioral problems in both genders, corroborating earlier studies (Allen et al., 2013a; Laghi et al., 2012). However, the results in the group of girls partially confirmed our hypotheses, because they revealed correlations with all the emotional-behavioral problems investigated, without showing just a predominant correlation between binge eating and internalizing problems. The results in the group of boys confirmed our hypotheses, as their levels of binge eating symptoms showed associations with both internalizing and other problems.

To explore these findings further we carried out separate multiple regressions for each gender, with BES score as the dependent variable. In the girls' regression ($N = 235$, Table 1), scores for internalizing problems, externalizing problems and other problems were used as predictors. The final model predicted 22.5% of variance in BES score ($adjusted-R^2 = .225$, $p = .000$) and the β analysis showed that all the predictor variables were significant independent predictors (all $p < .05$), with other problems being the strongest predictor.

Table 1. Multiple stepwise regression with BES score in a community sample of girls ($N = 235$) as the dependent variable and internalizing problems, externalizing problems and other problems as potential predictors

<i>Predictors</i>	<i>B</i>	<i>SE</i>	β	<i>p</i>	<i>R² (adjusted)</i>	<i>Var. F (p)</i>
YSR/EXT	-.131	.065	-.143	.044		
YSR/INT	.131	.054	.203	.016	.235 (.225)	23.648*(.000)
YSR/OTH	.513	.122	.386	.000		

Notes. $p < *.001$. ^a BES = Binge Eating Scale; YSR = Youth Self Report 11/18; YSR/INT = Internalizing problems. YSR/EXT = Externalizing problems; YSR/OTH = Other problems.

In the boys' regression ($N = 147$, Table 2), age, internalizing problems and other problems were entered as predictors; the externalizing problems' score was not entered as a potential predictor because it was not correlated with BES score. The final model explained 11.6% of variance in BES scores ($adjusted-R^2 = .116$, $p = .000$). Analysis of β coefficients indicated that the score of other problems was the only significant predictor of variance in BES score ($\beta = .236$, $p = .017$).

Table 2. Multiple stepwise regression with BES score in a community sample of boys (N =147) as the dependent variable and age, internalizing problems and other problems as potential predictors ^a

<i>Predictors</i>	<i>B</i>	<i>SE</i>	β	<i>p</i>	<i>R² (adjusted)</i>	<i>Var. F (p)</i>
Age	.577	.336	.139	.088		
YSR/INT	.065	.055	.119	.238	.135 (.116)	7.409* (.000)
YSR/OTH	.247	.102	.236	.017		

Notes. *: $p < .001$. ^a BES= *Binge Eating Scale*; YSR = *Youth Self Report 11/18*; YSR/INT = *Internalizing problems*. YSR/OTH = *Other problems*.

Therefore, with respect to girls and partially contrary to our expectations, our results would suggest that both externalizing and other problems, besides internalizing ones, could be a risk factor for BED, supporting some findings in which binge-eating symptoms were correlated with delinquent behavior (Ballarotto et al., 2017). With respect to boys, as expected, binge eating symptoms were associated with both internalizing and other problems even if the latter appear to be the main risk factor for BED in boys.

The discrepancy between boys and girls in the found co-occurrence may be due to gender differences in manage the feelings of body dissatisfaction, on which males are used to attempt a proactive control through physical exercise and body-shaping, rather than the dieting that is a girls' tendency (Furnham et al., 2002). Therefore, boys may be less vulnerable to the impulsivity and the loss of control that characterized both the binge eating, usually losing the control on a diet, and the externalizing problems, based on an aggressiveness that physical exercise can help to manage during adolescence. However, taken together these findings suggest that efforts to prevent binge eating in adolescents would benefit from monitoring and reduction of associated symptoms, with particular emphasis on those captured by the 'other problems' scale of the YSR -including social problems such as substance use, thought problems such as suicidal ideation and identity problems such as self-harm behavior- which appear to be a risk factor for BED in both genders, particularly in boys, whereas internalizing and externalizing problems appear to be female-specific risk factors.

However, our conclusions should be further investigated and cannot be generalized, because this study has several limitations. First, the reliability of our results is limited because we relied exclusively on self-report measures. Second, boys were under-represented in our sample, maybe affecting the results on gender differences. Third, we focused on risk factors for binge eating, analyzing emotional-behavioral problems as potential predictors, but there is evidence that these relationships are reciprocal and that BED may predict internalizing, externalizing and others

problems (Skinner et al., 2012; Stice et al., 2009). Moreover, we did not consider other relevant variables that could be related to binge eating symptoms and other associated internalizing or externalizing problems, for example physical conditions of overweight or obesity (Merlo, Frisone, Settineri, & Mento, 2018), as well as variables related to the psychological functioning, such as impulsivity, self-esteem, alexithymia, emotion regulation and attachment (Feingold & Mazzella, 1998; Furnham et al., 2002; Laghi, Baiocco, Ghezzi, Petrocchi, & Pace, 2012; Pace, Cavanna, Guiducci, & Bizzi, 2015; Pace, Guiducci & Cavanna, 2016; Pace, Guiducci & Cavanna, 2017).

The reliability of our findings could be established through further research involving larger samples containing a higher proportion of boys and using a multi-method approach rather than relying solely on self-report measures.

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