



Original article

Which Dieters Are at Risk for the Onset of Binge Eating? A Prospective Study of Adolescents and Young Adults

Andrea B. Goldschmidt, Ph.D.^{a,*}, Melanie Wall, Ph.D.^b, Katie A. Loth, M.P.H., R.D.^c, Daniel Le Grange, Ph.D.^a, and Dianne Neumark-Sztainer, Ph.D., M.P.H., R.D.^{c,d}^a Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, Illinois^b Department of Biostatistics, Columbia University, New York, New York^c Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, Minnesota^d Division of Adolescent Health and Medicine, Department of Pediatrics, University of Minnesota, Minneapolis, Minnesota

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A B S T R A C T

Purpose: Dieting is a well-established risk factor for binge eating, yet the majority of dieters do not develop binge eating problems. The purpose of the current study was to examine psychosocial factors involved in the relation between dieting and binge eating over a 10-year follow-up period.**Methods:** A population-based sample ($n = 1,827$) completed surveys assessing eating habits, psychological functioning, and weight status at 5-year intervals spanning early/middle adolescence (time 1), late adolescence/early young adulthood (time 2), and early/middle young adulthood (time 3). Dieting, along with depression symptoms, self-esteem, and teasing experiences at time 1 and time 2, was used to predict new onset binge eating at time 2 and time 3, respectively. Interactions between dieting status and varying degrees of these psychosocial factors in relation to binge eating onset were also tested.**Results:** Dieters were two to three times more likely than nondieters to develop binge eating problems over 5-year follow-ups. At most time points, depression symptoms and self-esteem predicted binge eating onset beyond the effects of dieting alone. Detrimental levels of these factors among dieters (relative to nondieters) increased the likelihood of binge eating onset only during the later follow-up period.**Conclusions:** Depression and self-esteem appear to be particularly salient factors involved in the relation between dieting and binge eating onset among adolescents and young adults. Early identification of these factors should be a priority to prevent the development of binge eating problems among already at-risk individuals.

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IMPLICATIONS AND
CONTRIBUTION

Study results suggest that depression symptoms and self-esteem are salient factors involved in the relation between dieting and binge eating onset among community-based adolescents and young adults. Early identification of these factors among dieters should be a priority to inform prevention and early intervention efforts targeting binge eating.

Dieting refers to intentional behavioral efforts at restricting food intake for shape or weight reasons [1]. More than 50% of adolescents and young adults report dieting [2,3], which is often unsupervised and may involve unhealthy behaviors such as skipping meals [4]. Ironically, such dieting predicts future weight gain and obesity, as well as the onset of subthreshold binge eating (the

consumption of unambiguously large amounts of food accompanied by loss of control while eating) and full-syndrome eating disorders [4–6], both of which are associated with medical and psychosocial complications [7,8]. However, because all self-reported dieters do not develop binge eating problems or eating disorders [9,10], it is important to determine which dieters are at highest risk for these problems.

Restraint theories posit that binge eating develops in response to deprivation resulting from prolonged and rigid dietary restraint (i.e., cognitive and/or behavioral weight reduction efforts) [11]. The dual pathway model further specifies that failures

* Address correspondence to: Andrea B. Goldschmidt, Ph.D., Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, 5841 South Maryland Avenue, MC 3077, Chicago, IL 60637.

E-mail address: goldschmidt@uchicago.edu (A.B. Goldschmidt).

in dietary restraint promote negative affect, which in turn fosters binge eating as a method of alleviating low mood symptoms [12]. Adults with bulimia nervosa and binge eating disorder, both characterized by recurrent binge eating, typically report an extensive dieting history [13,14]; by adolescence, dieting behaviors and related cognitions are prevalent among those with binge eating [7].

Two prospective studies suggest that dieters most at risk for developing clinically significant eating disturbances are those with severe disordered eating symptoms and cognitions [9,10]; however, there has been limited exploration of other psychosocial factors that may be involved in the relationship between dieting and binge eating. Depression symptoms, poor self-esteem, and teasing experiences have been identified as potential moderators in adolescents and young adults based on cross-sectional research [15–19] and prospective studies of up to 2 years [12,20], with most theoretical models implicating binge eating as a method of coping with negative affect related to these factors [12]. The generalizability of study findings could be enhanced by examining the relation between these psychosocial variables and binge eating over longer time frames, and using large, community-based samples, including both males and females.

This study aims to expand our understanding of the relation between dieting and binge eating by examining, within a population-based sample of adolescents and young adults, a range of potential variable risk factors (i.e., modifiable factors preceding the outcome of interest) [21] contributing to binge eating onset, beyond the effects of dieting. The overarching goal was to facilitate identification of individuals at highest risk for binge eating onset to assist with prevention and early intervention efforts. Specific research questions were as follows: (1) Is dieting longitudinally related to the onset of binge eating among adolescents and young adults over 10 years?; (2) Which psychosocial factors add to the prediction of binge eating onset beyond the effects of dieting alone?; and (3) Are there differential effects in the way psychosocial factors relate to binge eating onset among dieters versus nondieters? We chose to examine factors related to the onset of binge eating rather than full-syndrome eating disorders because binge eating is associated with negative physical and psychosocial sequelae even at subclinical levels [7]. Based on the previous literature [12,15–20], we expected dieting to significantly predict binge eating onset. We further anticipated that depression symptoms, poor self-esteem, and teasing experiences each would be associated with binge eating onset beyond the effects of dieting alone, as each of these symptoms may lead to momentary distress, and binge eating may be used to alleviate this distress. Finally, we expected the association between binge eating onset and depression symptoms, poor self-esteem, and teasing experiences to be stronger among dieters compared with nondieters.

Methods

Study design and population

Data were drawn from three waves of Project EAT (Eating Among Teens), a 10-year longitudinal study of eating behaviors, weight outcomes, and related psychosocial factors among young people. Project EAT-I included middle and high school students attending 31 public schools in the Minneapolis/St. Paul metropolitan area of Minnesota who completed surveys and anthropo-

metric measures during the 1998–1999 academic year [22]. At 5-year (Project EAT-II; 2003–2004) and 10-year follow-up (Project EAT-III; 2008–2009), participants were invited to complete follow-up surveys investigating changes in previously assessed health behaviors. All study protocols were approved by the University of Minnesota's Institutional Review Board.

Of the original 4,746 participants in EAT-I, 1,304 (27.5%) were lost to follow-up. The remaining 3,442 participants were invited to complete EAT-II and EAT-III surveys. Of these, 1,902 (55.3%) individuals completed all three surveys. Seventy-five participants were missing outcome binge eating data, leaving 1,827 participants for the current analyses (56.9% females; $n = 1,040$). At both time points, attrition was primarily because of inability to contact participants. Because respondents were disproportionately females, Caucasian, and of higher socioeconomic status (SES), statistical adjustments were made to account for differential response rates (see section: Statistical analysis).

The sample (57% females) consisted of a younger (30.3%; M baseline age = $12.8 \pm .7$ years; M age = $23.1 \pm .7$ years at 10-year follow-up) and older cohort (69.7%; M baseline age = $15.9 \pm .8$ years; M age = $26.2 \pm .8$ years at 10-year follow-up), and was diverse in terms of race/ethnicity and SES [23].

Measures

The Project EAT survey assesses cognitions, behaviors, and attitudes related to eating and psychological functioning. To allow for longitudinal comparisons, key items used in this article were consistent across the three study waves. Test–retest data for the EAT-I survey were collected from 161 7th and 10th grade students, who completed identical versions of the survey approximately 2 weeks apart. Further details on survey development are reported elsewhere [22,24,25].

Eating behaviors

Dieting was assessed with the question, “How often have you gone on a diet during the last year? By ‘diet’ we mean changing the way you eat so you can lose weight.” Responses included never; 1–4 times; 5–10 times; >10 times; and I am always dieting. Participants were categorized as nondieters (never) or dieters (all other responses; Spearman r for test–retest data = .71; percent agreement [never vs. ever dieted] for test–retest data = 76%). Binge eating was ascertained as follows: “In the past year, have you ever eaten so much food in a short period of time that you would be embarrassed if others saw you?”; “During the times when you ate this way, did you feel you couldn't stop eating or control what or how much you were eating?” Participants responding affirmatively to both questions were classified as binge eaters ($\kappa = .64$).

Psychosocial factors

Depression symptoms were assessed via Kandel and Davies' six-item scale for adolescents [26], which inquires about the frequency of the following symptoms during the past year: dysphoric mood, tension/nervousness, fatigue, worry, sleep disturbance, and hopelessness. Scores range from 6 to 18, with higher scores indicating greater depressive symptoms ($\alpha = .84$). Self-esteem was assessed via six items from the Rosenberg Self-Esteem Scale [27]. Scores range from 6 to 24, with lower scores indicating lower self-esteem ($\alpha = .71$). A study examining the

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