To binge or not to binge?

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How to Use This Article

Binge eating is the most common type of disordered eating behavior among children and adolescents with obesity (1). Because of its association with elevated levels of psychosocial distress (2), the experience of binge eating adds to the burden caused by obesity. In the current chapter, an overview will be provided of the conceptualization, prevalence, development and course of binge eating in youth suffering from obesity.

Conceptualization of binge eating

The eating behaviour of children who have obesity is more complex than initially thought. It is demonstrated that individuals with obesity can display different eating behaviours which are not only driven by hunger (i.e., homeostatic eating), but also in the absence of hunger (i.e., hedonic eating) such as snacking after a meal, eating comfort food when feeling depressed, eating during the night, eating too much followed by vomiting, restrained eating and meal skipping. If such eating patterns occur on a regular basis or deviate too much from the regular eating guidelines, we describe the behaviours as eating disturbances or disordered eating behaviours (3). One of the most studied disturbance is the so called “binge” or “binge eating”.

Two criteria for defining binge eating

Binge eating (BE) is defined as the consumption of a large quantity of food, within a restricted period of time and associated by feelings of loss of control over eating (LC) (4). The latest version of the guidelines of American Psychiatric Association (APA; 4) requires the presence of both the large quantity of food criterion as well as the LC criterion to classify an eating episode as a BE episode. The presence of these two criteria is also referred to as objective BE episodes (OBE), with ‘objective’ referring to the objectively large amount of food that has been eaten during the binge (or in other words: the consumption of what would generally be

regarded as a ‘large’ amount of food, irrespective of what else was eaten that day). Moreover, large may be used to refer to the amount of any particular type of food or the overall quantity of the food consumed. The type of food consumed during a BE episode varies across individuals, but typically involves high-calorie and unhealthy foods (i.e., palatable foods) (5). The LC criterion can be described as the feeling that one is not able to stop eating once eating has started, or that one is ‘driven’ or ‘compelled’ to eat (6).

BE can occur as a symptom or as part of a syndrome. When BE occurs on a regular basis – that is at least once a week over the past three months – BE is a central part of eating disorder syndromes like Bulimia Nervosa (BN) or Binge eating Disorder (BED). Although in some children and adolescents with obesity, BE can be part of such syndrome, the current chapter will exclusively focus on BE as a symptom, as this affects much more youth with obesity.

Over the years, a distinction has been made between two types of BE depending on the amount of food that has been eaten (7). While the experience of LC is inherent to both types of BE episodes, in an objective BE episode (OBE) an objectively large amount of food has been eaten (which corresponds to the definition of the APA), while a subjective BE episode (SBE) is specified by eating a subjectively large amount of food (i.e., an amount that is considered to be large by the individual but not by others). Both types of BE should not be considered as two sides of the same continuum since they can co-occur. Importantly, Goossens and colleagues found that the co-occurrence of these two types of BE in adolescents was associated with the most severe eating pathology profile (e.g., more concerns about eating, weight and shape, restraint eating and depressive symptoms) (8). In line with this finding, researchers have stated that the element of LC is the most important in determining the disturbed character of a BE episode (9).

Table 1 provides an overview of the different types of overeating episodes. As the table shows, the distinction between episodes where one has eaten more than one is used to eat or more than someone else would eat under the same circumstances (the so called overeating episodes) and the BE episodes lies in whether or not the patient has experienced LC during the eating episode. To detect BE, the clinician should ask about each form of overeating. Also, it is important to mark that the different types of episodes are not mutually exclusive, so it is possible for a patient to report different types (6).

Table 1. Difference between overeating and binge eating (BE)

	Amount eaten	
	'Large'	Not 'large', but viewed by subject as excessive
Loss of control experienced	Objective Binge Eating (OBE)	Subjective Binge Eating (SBE)
No loss of control experienced	Objective Overeating (OO)	Subjective Overeating (SO)

Binge eating in children and adolescents

In children and adolescents, research regarding the conceptualization of BE has expanded during the last decades. Marcus and Kalarchian made one of the first attempts to develop youth-specific research criteria for conceptualizing BE(D) in children of 14 years and younger (10). Again, the LC criterion occupied an important place within these provisional criteria whereas the large quantity of food criterion was kept out of the definition of BE. The authors argued that because of the variability of food-intake over time in growing children, LC represents a more salient feature in the evaluation of disordered eating compared to the amount of food that has been eaten. Also, there is a possibility that children and adolescents do

experience LC but that this is not accompanied by eating large amounts of food because they do not have access yet to large amounts of food. As such, they are not in a position to decide for themselves how much they eat and therefore the amount eaten during binges is to be considered to be rather limited. Moreover, it was concluded that the presence of LC, even if it is not accompanied by eating objectively large quantities of food, is associated with elevated levels of eating pathology, maladjustment and poorer quality of life in domains of health, mobility and self-esteem (9). In other words, for the identification of disordered eating in children and adolescents, we need to acknowledge that it is clinically relevant to focus on LC.

Assessment of binge eating

The Children's Eating Disorder Examination Questionnaire (ChEDE-Q) is proven to be an appropriate instrument to screen for disordered eating in general, and BE-episodes in specific (14). In case of elevated levels of disordered eating as indicated in the ChEDE-Q, a clinical interview is warranted to further examine the presence and severity of the eating disorder pathology, for example with the Children's Eating Disorder Examination (ChEDE) (15; 16). Table 2 provides an overview of the main instruments that can be used to detect BE in youth.

Table 2. Assessment of binge eating (BE) in youth

Instrument	Method	Specifications with regard to BE	Age
Children's Eating Disorder Examination (ChEDE) (15;16)	Semi-structured clinical interview	DSM-Eating disorder diagnoses OBE, SBE, LC presence and frequency over last 3 months	8 to 18 years
Children's Eating Disorder Examination-Questionnaire (ChEDE-Q) (14)	Self-report questionnaire	Screening for DSM-Eating disorder diagnoses OBE, SBE, LC presence and frequency over last month	8 to 18 years
Eating Disorder Inventory (17)	Self-report questionnaire	No separate BE scale, BE item is part of Bulimia subscale (together with e.g., compensatory behaviors)	Clinical and non-clinical norms for females (13-53 years)
Questionnaire of eating and weight patterns-revised (18)	Self-report questionnaire	Assessing aspects of BED and subclinical BE	10-18 years (adolescent and parent version)

Although LC was found to be the most important criterion for classifying BE, some results show that assessing the binge size may still provide valuable information as well. For example, researchers concluded that within the LC group, different clinical profiles emerge depending on whether or not large quantities of food are reported. More specifically, these researchers found that overweight youth reporting OBE were characterized by the highest levels of eating– and general psychopathology. The clinical profile of youngsters who reported SBE fell in between that of those without LC and those who reported OBE (19; 8). Moreover, the phenomenology of LC was further examined in a multisite study among 445 European and American youth with the use of clinical interview methodology. LC was associated with eating forbidden foods before the episode, eating when not hungry, eating alone, experiencing secrecy and negative emotions and a sense of numbing out while eating (20). Based on the

aforementioned findings, researchers developed a set of provisional criteria for a new diagnosis, the Loss Of Control Eating Disorder (LOC-ED), in children. In these diagnostic criteria, the binge size criterion is included as a possible characteristic of LC but not as a necessary condition for diagnosing a child with LOC-ED (21). Thus, although LC seems to be the most important criterion for identifying aberrant eating episodes, the binge size criterion should not be totally neglected.

Prevalence of binge eating

Prevalence rates of BE in children and adolescents differ across studies. Differences depend on which definition of BE is used (assessing LC in general, or solely focussing on OBE without considering SBE), which instruments are used to assess BE (clinical interview versus self-report questionnaire versus laboratory test meal), and which samples are studied (overweight or normal weight, treatment seekers versus non-treatment seekers). Nevertheless, despite overall differences between studies, some interesting trends are to be noted.

First of all, studies indicate that BE is reported by a substantial part of youngsters from the general population. Prevalence rates show that roughly 25% of community adolescents report at least one episode of BE over eating over the past month (1; 22) and around 10% report recurring episodes (23).

Second, BE has been found to be associated with gender, age and weight status. Specifically, BE seems particularly prevalent in women (24), adolescents (25; 26) and in those with a higher body weight (1). Importantly, while BE seems to be more prevalent among females in community samples (24; 27), no significant differences with regard to the occurrence was found between boys and girls in overweight samples (28; 29). Interestingly, in overweight

youth, BE is generally more frequently reported by those children and adolescents who seek treatment (40%) compared to those who do not seek treatment for their overweight (20%) (10).

Development and maintenance of binge eating

As with any type of psychopathology, the development of BE can be seen as a complex interaction between multiple risk- and protective factors (30). Overall, it is assumed that factors on both socio-cultural, familial and individual level may contribute to the development of BE (31). To date, little youth-specific theoretical models exist to describe the development and maintenance of psychopathology (and more specifically in this case BE pathology). Therefore, researchers in the paediatric field are compelled to rely on adult models. In the following section, two important etiological theories for explaining BE are outlined.

The Cognitive Behavioural Theory (CBT)

In the CBT (32; 33), a central role is proposed for a dysfunctional process for evaluating one's own self-worth. In contrast with most people who evaluate themselves on the basis of their performance in a variety of life domains (such as the quality of their relationships, work, parenting, etc.), people with eating disorders judge themselves largely, or even exclusively, in terms of their shape, weight and eating habits and their ability to control them. As a consequence of this over-evaluation, their entire lives are focused on efforts to control their diet, pursue weight loss and avoid overeating and weight gain. This dysfunctional system for evaluating self-worth is also labelled as the core psychopathology of eating disorders. According to this model, this over-evaluation of eating, weight and shape leads to attempts to control these

domains by strict dietary rules (i.e., dietary restraint). The concept of dietary restraint refers to an individual's attempt to restrict food intake in order to control body weight (34). As part of this restriction, rigid diet rules are often followed. In a moment of weakness, however, these rigid rules may be disrupted and as a consequence, an individual may totally lose control over his or her eating behaviour with a BE episode as a result. Thus, BE develops as a result of the subjects' failing attempts to restrict their eating. In turn, BE is evaluated by the subject as a failure and this maintains and even magnifies the core psychopathology as well as the subjects' attempts to restrict their eating, which places the subjects in a vicious circle.

In support, BE was consistently found to be associated with more concerns about eating, weight and shape in both treatment seeking and non-treatment seeking overweight children and adolescents (19; 28; 35). This evidence for the relationship between the over-evaluation system and BE among overweight youth demonstrates that being concerned about ones eating, weight and shape is not simply a characteristic of being overweight but can be considered an important feature of eating disorder pathology. In addition to the relation between BE and concerns about eating, weight, and shape, there is also a robust link between BE and elevated levels of dietary restraint, both among non-treatment seeking overweight (25) and normal weight children (26; 36).

In order to investigate how the three main features of the CBT, that is the over-evaluation system, dietary restraint and BE, operate together, this pathway was investigated in a large sample of both treatment seeking and non-treatment seeking overweight youth. After taking into account possible differences between treatment seekers and non-treatment seekers, it was found that the over-evaluation of eating, weight and shape was positively associated with dietary restraint and dietary restraint was in turn positively related to BE thereby reconfirming the value of this pathway among overweight youth (37). Consequently, it is recommended to

assess the relevant variables of this model via psychological measures when BE is reported (for example by using the ChEDE-Q). Moreover, evidence has been found for reducing BE using CBT-techniques (54).

The Interpersonal Vulnerability Theory (IPT).

According to the IPT (38; 39), disturbances in early child-caretaker relationships lead to insecure attachment, which in turn may lead to social self-disturbances, feelings of loneliness and low self-esteem. This can then cause affective dysregulation, which in the end may trigger BE to cope with the aversive emotional states.

In support of the IPT, there is evidence for the simultaneous impact of interpersonal problems and affectivity in the context of adolescent BE, both in community samples (40; 41; 42), and overweight samples (19; 28; 29).

In younger populations, a recent review found support for the role of attachment in weight-related outcomes such as obesity in children (46). Furthermore, the assumptions of the IPT were tested in a sample of 8 to 17 year old non-treatment seeking youngsters and found positive associations between social problems and LC. This association was mediated by negative affect, thereby providing initial support for the IPT (40). Also, in a cross-sectional study among a community sample of 8-11 year old children, researchers found that those who reported LC were characterised by lower self-esteem and a less secure attachment towards both of their parents. The relation between self-esteem and LC was fully mediated by attachment towards mother and partially mediated by attachment towards father (43). Furthermore, other researchers found a relationship between parental rejection and emotional eating in obese youngsters, mediated by maladaptive emotion regulation strategies of the youngster. This suggests that parental rejection may undermine the child's ability to regulate emotions.

Subsequently, the child may use food to escape from negative emotions, which may lead to weight gain and eventually obesity (44). Finally, researchers observed less interpersonal involvement and more maladaptive family functioning during mealtimes in the home environment of children (8-13 years old) with LC eating compared with those who do not experience LC (45). Consequently, when BE is reported it is recommended to assess these relevant variables via psychological measures as well. Interestingly, recent studies show some promising evidence to tackle disordered eating behaviours such as BE using interpersonal intervention techniques (for example Attachment Based Family Therapy or ABFT) (55). Also, treatments focusing on emotion regulation have proven to be feasible in youth with obesity (56), and beneficial in terms of reducing BE in adults (57).

Course and prognosis of binge eating

BE is associated with a wide range of physical (e.g., weight/fat gain, obesity) and psychosocial (e.g., low self-esteem, depressive symptoms) problems. In addition, high comorbidity rates exist between BE and other pathological eating attitudes and behaviours (e.g., dietary restraint, food related craving) (22). To date, few longitudinal studies exist that examined the psychological impact and course of BE in youth. Yet, BE in youth has already been identified as longitudinal risk factor for the development of overweight and obesity (47), clinical eating disorders (e.g., Bulimia Nervosa, Binge Eating Disorder), as well as other types of disorders such as depression or addiction (48; 49) in adulthood. In line with this, researchers concluded from their longitudinal study that in non-treatment seeking preadolescents, LC has a moderate stability with almost half of those who experience LC showing a tendency toward persistent or recurrent eating problems over a 2-year period (51). These findings clearly show

that BE in youth may have far-reaching consequences and cannot be considered as a transient phenomenon.

Some studies have also looked specifically into the course and prognosis of BE in youth with (a risk for) obesity. For example, results of a prospective study indicate that LC in youngsters predicted increased weight gain over time (47). Moreover, researchers examined LC in a sample of 6 to 13 year old children (at risk for overweight) and concluded that LC at baseline was associated with the development of partial- and even full syndrome BED 4.7 years later. Moreover, 52.2% of the children who experienced LC at baseline still reported LC at follow-up. The presence of LC at baseline predicted increases in disordered eating attitudes and anxiety at follow-up. Also, compared with children who never experienced LC or who reported LC at baseline but not at follow-up, those children who persisted in LC also experienced more increases in disordered eating attitudes and in depressive symptoms (50).

Despite BE is often reported by youth suffering from obesity, many weight control programs are not developed for treating symptoms of disordered eating such as BE (13). Furthermore, for professionals like dieticians, general practitioners or pediatricians, it is sometimes difficult to understand and treat disordered eating behaviors such as BE, specifically when they are related to other psychological factors. When looking at evidence for weight control interventions in the short term, some studies have observed a reduction in various measures of eating pathology (19), however this has often not been observed in the long term (28). Nevertheless, research clearly shows the importance of looking at BE in the treatment of obesity. For example, a six-year follow-up study of overweight youngsters who followed an inpatient treatment showed that LC is a relatively stable construct among 25% of overweight youngsters. Moreover, especially older youngsters and youngsters who were characterized by elevated levels of shape concerns at baseline tended to persevere in LC six years later. When

subdividing the LC criterion into SBE and OBE, results showed that OBE represented the most stable type of aberrant eating episodes. Furthermore, in the subsample of youngsters who already reported LC at T1, the general mean scores of the eating pathology subscales did not significantly decrease over the six-year period showing once again that overweight youngsters reporting LC may be considered a specific group at risk (13). Another interesting study of Wildes and colleagues compared treatment outcomes (in terms of weight change) in children with obesity with and without accompanying BE. These researchers found that improvement in percentage overweight was only reported in the children without accompanying BE. More recently, a systematic review examined the relationship between BE, LC and weight loss in children and adolescents and these researchers concluded that the persistence of BE/LC was associated with less weight loss (52). Overall, it can be concluded that, also in youth with (a risk for) obesity, the presence of BE is not transient, it can be associated with other disordered eating attitudes or behaviours, and/or it can reduce the impact of weight control programs (53). Therefore, it is importance to consider BE in the development of weight control programs for youth with obesity.

Conclusion and Implications

BE can be conceptualized by a feeling of losing control over one's eating behaviour and may be accompanied by the consumption of objectively large amounts of food (OBE) but also with subjectively large amounts of food (SBE). Compared to normal weight youth, youngsters with overweight appear to be at an elevated risk for experiencing BE episodes (1). Because of the high prevalence rates, its stability over the time, the association with other eating disorder characteristics (like rigid dieting), as well as more general psychopathology (like depression) and weight gain over time, BE may serve as an important component of the screening and

treatment of overweight and obesity in children and adolescents. However, the detection of BE may be complicated since the associated feelings of guiltiness often lead to the fact that patients tend to hide it. So, it should be systematically screened for.

We can conclude that it is important that obesity specialists are alert for BE characteristics. If they fail to recognize the dietary restraint attitudes of their young patients, this may end up in inducing more rigid dieting-intentions which in turn may result in BE (32; 33). On the other side, exploring factors like emotional eating, low self-esteem, negative mood or social isolation is also relevant as it can guide our understanding of other possible mechanisms that may increase the risk of disordered eating behavior (38; 39). In line with recommendations made by Braet and colleagues (58), we propose the following general questions for obesity specialists to screen for BE and its possible associated features.

Construct	Possible question (for the child and/or the parent)
Types of BE (OBE, SBE, LC)	• Does the child report eating large amounts of food? • Does the child experience loss of control over his/her eating?
Over-evaluation system	• Does the child report excessive concerns with eating, weight and/or shape?
Dietary restraint	• Is the child preoccupied with restricting food intake? • Does the child report restraint attitudes?
Interpersonal problems	• Does the child report issues within the parent-child relationship?
Affectivity/emotion regulation	• Does the child report eating in response to negative emotions?

When BE and some of it associated features are identified in the initial consult and/or when the assessing clinician does not feel adequately skilled, it is appropriate to discuss with the parents the option of referring the child and family for more in-depth assessment by a suitably qualified paediatric psychologist. Consequently it is recommended not only to assess BE and its associated features in-depth but also to refer for a specialized treatment where these psychological components can be targeted.

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