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Binge Eating in Obese Adolescents: An Evolutionary Concept Analysis

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Abstract

Purpose—The purpose of this paper is to provide an analysis of the concept of binge eating in obese adolescents.

Methods—Rodgers' evolutionary approach was used to frame this analysis. A search was conducted within CINAHL, Medline, and PsycINFO for publications between 1980 and 2011.

Findings—Conceptual shifts in the meaning of binge eating have occurred over the past 30 years, yet the two enduring attributes are consumption of a large amount of food and a loss of control over eating.

Conclusion—Though this analysis demonstrates a consensus concerning the core attributes of binge eating, further refinement of the nuances, subtleties, and use of the concept in relation to adolescents is needed.

Keywords

Binge eating; adolescents; obesity; evolutionary method; concept analysis

Introduction

In the United States, the prevalence of adolescents who are obese has more than tripled over the past thirty years, increasing from 5% in 1976 to over 18% in 2008 (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). Obese adolescents are also more likely to be obese as adults, ultimately leading to a myriad of health, psychosocial, and financial consequences (Finkelstein et al., 2008; Goodman & Whitaker, 2002; Yach, Stuckler, & Brownell, 2006). With the high prevalence of adolescent obesity, identification of physiological and psychological factors associated with obesity has become a national priority.

There has been debate over whether all obese individuals have disordered eating patterns. Yet, it is now recognized that obesity is a heterogeneous condition. Obese individuals may exhibit disordered eating behaviors or patterns, including binge eating. The term “binge eating” is used in clinical and research literature to specify a particular form of overeating. The most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM) defines binge eating as eating an amount of food that is larger than most people

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would eat in a discrete period of time, accompanied by a sense of lack of control (American Psychiatric Association, 2000). Binge eating occurs across the weight spectrum and can be seen across all eating disorder diagnostic categories (i.e., anorexia nervosa, bulimia nervosa, and binge eating disorder [BED]) (Fairburn & Wilson, 1993). With the rising rates of obesity and recent research elucidating obese individuals with disordered eating patterns, more attention has been placed on the role binge eating plays in adolescent obesity.

Several retrospective studies have suggested binge eating begins in childhood or adolescence (Abbott et al., 1998; Allen, Byrne, La Puma, McLean, & Davis, 2008; Grilo & Masheb, 2000; Marcus, Moulton, & Greeno, 1995). Further, among obese adolescents, researchers have found that between 30% and 60% of females and 35% of males have experienced a binge-eating episode (Berkowitz, Stunkard, & Stallings, 1993; Britz et al., 2000; Decaluwé & Braet, 2003a). Due to the early onset and substantial prevalence of binge eating, and associations of binge eating with increased physical and psychosocial problems (Glasofer et al., 2007; Skinner, Haines, Austin, & Field, 2012; Tanofsky-Kraff et al., 2012), the study of binge eating among obese adolescents has generated wide interest.

Binge eating as applied to obese adolescents is a developing concept: considerable evolution and refinement has occurred since binge eating was introduced in the DSM under the diagnosis of bulimia 30 years ago (American Psychiatric Association, 1980). Given the complexity, ambiguity, and commonality of the term in everyday language, clarification of the concept is necessary. If a concept does not have clear attributes, the ability of practitioners and researchers to operationalize and use the concept in fundamental tasks is limited (Rodgers, 1989). Consequently, it is difficult to compare, contrast, and synthesize research, and utilize the concept in clinical practice. Thus, the purpose of this analysis is to use Rodgers' evolutionary approach to examine the concept of binge eating with a specific focus on the application to obese adolescents.

Method

Concepts are largely identified in common parlance by means of a particular set of terms or expressions. However, a concept is more than this—a concept consists of a cluster of attributes common to a phenomenon. Conceptual analysis entails the fragmenting of a concept to identify its constituent parts, fostering the discovery of core attributes of a concept (Rodgers, 2000). Given the dynamic nature of binge eating in obese adolescents and the influence of the historical and social context, Rodgers' evolutionary method was deemed most appropriate for this analysis.

Rodgers' evolutionary method of concept analysis involves a rigorous and systematic approach, emphasizing inductive inquiry. The philosophical foundations underlying this approach are naturalistic, interpretive, and post-positivist. Consequently, concepts are seen as dynamic, context dependent, and pragmatic. The evolution of concepts can be traced through a series of related changes, providing a basis for further inquiry and development. In order to characterize and describe phenomena and communicate effectively, concepts must be clarified (Rodgers, 1989; Rodgers, 2000). Rodgers' evolutionary method involves the following five iterative steps, which will be used as a framework for this study:

1. Identify the concept of interest and associated expressions (including surrogate terms).
2. Identify and select an appropriate setting and sample for data collection.
3. Collect data relevant to identify the attributes of the concept and the contextual basis of the concept.
4. Analyze data to identify the characteristics of the concept.
5. Identify implications, hypotheses, and implications for further development of the concept (Rodgers, 2000, p. 85).

Setting and Sample

The Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and PsycINFO were used, focusing on binge eating in obese adolescents without regard to diagnostic classification (i.e., bulimia and BED). Search criteria included: published between 1980 and 2011, contained the keywords binge eating and obes* or overweight, published in English, and addressed adolescents aged 13–18 years. To facilitate discovery of shifts in the concept over time, a timeframe of literature published between 1980 and 2011 was chosen, as the mid-1980s marked the beginning of systematic research pertaining to binge eating in obese individuals. Each search was conducted in increments of 10-years (i.e., 1/1/1980 to 12/31/1989 to 12/31/1990 to 12/31/1999 and 2000 to 11/1/2011). Initially, these searches uncovered 389 references (Figure 1). Articles were excluded if there was no stratification between adolescents versus adults (i.e., age range from 15–65 years and no sub-analysis of adolescents), or if multiple articles were published from the same study that did not add to the data. This yielded a total of 59 articles for analysis.

Data Analysis

Following the sample selection, papers were reviewed twice. The initial review provided an overview of the paper and immersion in the literature. In the second review individual coding sheets were used. Data were extracted on: context, core attributes, antecedents, consequences, surrogate terms, and related concepts. All coding sheets were reviewed inductively for recurrent themes, changes in the concept over time, and emerging trends with an emphasis on context (Rodgers, 2000). Next, each category of data (attributes, antecedents, consequences, surrogate terms, and related concepts) was examined, compared, and contrasted to identify major themes. This phase of analysis was iterative, involving continual organization and reorganization of points until cohesive and comprehensive descriptors were generated.

Results

Sample

Overall, 59 articles were included: 51 were research studies and 8 were commentaries or literature reviews. Of the 51 research studies included, 48 were non-experimental studies, 2 were experimental studies, and 1 was a quasi-experimental study. Out of the 51 research studies included, normal weight and overweight/obese adolescents were analyzed in 27

studies, while 24 studies solely focused on overweight/obese adolescents. Self-report questionnaires were included in 27 studies. Interviews were included in 24 studies, with 4 of these studies utilizing both self-report questionnaires and interviews.

Context of Binge Eating in Relation to Obese Adolescents

Binge eating was first identified and described as a distinct eating pathology among obese individuals by Albert Stunkard in 1959. Stunkard made the clinical observation that some obese adults had distressing episodes of overeating in which they experienced a lack of control; however, this phenomenon received little systematic attention until the 1980s (Mitchell, Devlin, de Zwaan, Crow, & Peterson, 2008; Stunkard, 1959). In 1980, the DSM-III adopted the symptom of binge eating under the new disorder “bulimia”, prompting increased interest in binge eating. Since 1980, the concept of binge eating has evolved and been refined in application to obese adolescents amidst the context of the growing obesity epidemic.

1980–1990—Between 1980 and 1990, binge eating was predominantly studied within larger samples composed of adolescents across the weight spectrum, including participants from eating disorder clinics (Arroyo & Tonkin, 1985; Ruggiero, Williamson, Davis, Schlundt, & Carey, 1988), schools (Lakin & McClelland, 1987; Ruggiero, Williamson, Davis, Schlundt, & Carey, 1988; Snow & Harris, 1989; Wolf & Crowther, 1983), and primary care settings (Moore, 1988). The primary feature of “bulimia” noted in the DSM-III (1980) was binge eating. Hence, the terms bulimia and binge eating were often used interchangeably and synonymously, and binge eating in adolescents was frequently studied within the context of bulimia or bulimia nervosa. (Humphries & Wrobel, 1983; Maloney & Klykylo, 1983; Ruggiero, Williamson, Davis, Schlundt, & Carey, 1988; Wadden & Stunkard, 1985). In 1987, the new diagnosis “bulimia nervosa” supplanted the former “bulimia” in the DSM-III-R. Bulimia nervosa now came to mean primarily binge eating, followed by an inappropriate compensatory behavior to prevent weight gain—most notably purging. This transition helped to dispel the notion that binge eating is synonymous with bulimia involving subsequent purging. Since binge eating was being primarily studied within the context of bulimia nervosa, it was believed that binge eating occurred mostly in normal weight adolescents (Blinder & Goodman, 1988; Maloney & Klykylo, 1983). Yet with the rise in adolescent obesity from 5% in 1980 to 10.9% in 1990, greater attention was placed on the role that binge eating played in obesity in the next decade (Troiano et al., 1995).

1990–2000—During the next 10 years, binge eating continued to be studied across the weight spectrum (Field et al., 1999; French et al., 1997; Moore, 1990; Neumark-Sztainer et al., 1998; Thompson et al., 1995; Van Strien, 1995; Vila et al., 1995) albeit, Berkowitz et al. (1993) and Pinhas-Hamiel et al. (1999) studied binge eating specifically in obese adolescents. The limited number of studies specifically related to binge eating behaviors in obese adolescents largely reflects the predominant paradigm of that time: obesity was viewed as a physical disorder, not yet associated with any distinct psychological or behavioral syndromes. Berkowitz et al. (1993) and Pinhas-Hamiel et al. (1999) found that 30% of obese adolescents binge eat, elucidating the notion that distinct psychological and

behavioral syndromes are associated with subgroups of obese adolescents. The high prevalence of binge eating in obese adolescents coupled with the continual rise in obesity marks the beginning of the expansion in studies specifically addressing binge eating as applied to obese adolescents.

2000–2011—Adolescent obesity research conducted between 2000 and 2011 demonstrates the increased interest in disordered eating among obese individuals. In this decade, eating disorders, disordered eating patterns and obesity were studied as intertwined phenomena. Yet, as more studies examine binge eating in obese adolescents, the limitations of the definition provided by the DSM have come to the forefront of discussion.

As research has increased in the field of binge eating, the defining characteristics of binge eating—a large amount of food and a loss of control over eating—have come under scrutiny (Goldschmidt et al., 2008a; Goldschmidt et al., 2008b; Goossens et al., 2007; Tanofsky-Kraff et al., 2009). These factors have been further examined to elucidate salience and relevance, and limitations have been recognized when applying these concepts to adolescents. These limitations include restrictions in adolescents' ability to understand and report psychological and cognitive symptoms (i.e., loss of control), potential differences in presentations of adolescent binges versus adult binges, extrapolations of constructs regarding symptom clusters and diagnostic presentations of binge from adults that may not resonate with adolescents (i.e., quantifying a large amount of food), and growth and development patterns that obscure diagnosis (Decaluwé & Braet, 2004; Goldschmidt et al., 2007; Goldschmidt et al., 2008a; Goldschmidt et al., 2008b; Goossens et al., 2007; Tanofsky-Kraff et al., 2007a; Tanofsky-Kraff et al., 2009; Theim et al., 2007).

Due to the recognized limitations in adolescents' abilities to recognize central concepts of binge eating, a shift has occurred in assessment from self-reporting questionnaires to interviewer-based instruments: 21 studies used interviewing to assess for binge eating. While a full comparison of measures used to assess binge eating is beyond the scope of this paper, interviewer-based and self-report instruments address both attributes of binge eating. Nevertheless, interviewer-based instruments allow researchers to better ascertain whether adolescents fully comprehend the concept. This was a noted limitation in prior research relying on self-report measures (Decaluwé & Braet, 2004).

Attributes of Binge Eating

Researchers have largely been guided by the definition of binge eating found in the DSM. Though attributes have been taken out and added throughout subsequent versions of the DSM, the overall body of literature points to two important attributes of binge eating as shown in Figure 2: consumption of a large amount of food and loss of control over eating.

Large amount of food—The most enduring attribute of binge eating is consumption of a large amount of food; 52 articles cite a large amount of food as a core attribute of binge eating and this attribute was consistently noted across all decades. The qualifier of a large amount of food is “an amount of food that is definitely larger than most people would eat during a similar period of time in similar circumstances,” (APA, 1993; APA, 2000) was added in the DSM-IV. This qualifier helps to contextualize the amount of food consumed

and also acts as a reference point; twenty-eight articles include this qualifier. Though a large amount of food has been the most cited attribute of binge eating and has important implications for weight status and metabolism, many researchers now posit that due to the difficulty in defining “a large amount of food” among adolescents and the high rate of psychopathology regardless of whether the amount of food is objectively large, this attribute may be less salient (Goldschmidt et al., 2008a; Goossens et al., 2007; Tanofsky-Kraff et al., 2007a; Theim et al., 2007). While the salience of a large amount of food is controversial as an attribute of binge eating, there is a remarkable consensus regarding the attribute of loss of control when describing binge eating.

Loss of control over eating—Though loss of control was not added into the definition of binge eating in the DSM until 1993, forty-two articles mention loss of control as a core attribute of binge eating (Figure 2). Loss of control over eating is now recognized as one of the most salient and relevant factors related to binge eating among adolescents as demonstrated by the increasing number of articles that mentioned this attribute in more recent decades.

Antecedents and Consequences of Binge Eating

The next iterative process of the evolutionary conceptual analysis cycle is an examination of the antecedents, phenomena that precede a concept, and consequences, phenomena expected to follow a concept (Rodgers, 1989). Two types of antecedents and consequences were identified: 1) antecedents and consequences of an individual binge episode and 2) antecedents and consequences of the onset of binge-eating behavior. The second of these types is complex and cyclic, making differentiation between the antecedents and consequences of binge eating challenging. Further, much of the research in this area has been associative, thus it is difficult to determine antecedents versus consequences. Conversely, the immediate antecedents and consequences of individual binge episodes are more identifiable.

Immediate antecedents and consequences—Immediate antecedents of an individual binge-eating episode include behavioral and emotional factors. Research suggests that behavioral antecedents of binge-eating episodes may involve consumption of “forbidden foods”, restricting prior to eating, or eating despite a lack of hunger (APA, 2000; Tanofsky-Kraff et al., 2007a). Emotional antecedents have also been identified, with the most notable being eating in response to a negative emotion or trigger. These negative emotions or triggers may be shame, depression, anger, sadness, or guilt (Allen et al., 2008; Decaluwé & Braet, 2005; Goldschmidt et al., 2008c; Stice et al., 2002; Tanofsky-Kraff et al., 2007a). Immediate consequences of a binge-eating episode include psychological/emotional and physical factors. Psychological and emotional consequences of binge-eating episodes include anxiety, guilt, shame, confusion, and fatigue (APA, 2000; Tanofsky-Kraff et al., 2007a; Tanofsky-Kraff et al., 2009). Physical consequences of binge-eating episodes that have been noted include feelings of fullness or sickness (APA, 2000; Tanofsky-Kraff et al., 2007a).

Cyclic Antecedents and Consequences

Determination of antecedents and consequences preceding the onset of binge eating behavior is difficult due to the cyclic and interrelated nature of pathways. Two of the most cited pathways include the dietary restraint pathway and the negative-affective pathway.

Dietary restraint—Historically, the dietary restraint pathway has largely been implicated in binge-eating behavior and has received much attention in the literature (Snow & Harris, 1989; Stice et al., 2002). The dietary restraint theory is based on the premise that caloric restriction increases the risk of binge eating when individuals shift reliance from physiological cues to cognitive control over eating behaviors. Individuals respond to any transgression of strict dietary regulation with an all-or-nothing response. Dieting efforts intended to compensate for the effect of binge eating then serve as a trigger to additional binges. This ultimately leads to repeated cycles of dieting and binge eating (Ackard, et al., 2003; Akkermann et al., 2011; Allen et al., 2008; Claus et al., 2006; Decaluwé & Braet, 2005; Goldschmidt et al., 2011). Though researchers often reference dietary restraint as a possible mechanism of binge eating (Ackard et al., 2003; Allen et al., 2008; Chen et al., 2008; Decaluwé & Braet, 2005), the evidence supporting the dietary restraint pathway is conflicting. While some studies have noted that adolescents who binge eat have higher rates of dieting than non-binge eaters (Ackard et al. 2003), others have found that not all binge eaters diet (Claus et al., 2006). Thus, dieting appears to be a necessary but insufficient condition in the developmental pathway of binge eating. Results have also been equivocal regarding whether dieting is an antecedent (Allen et al., 2008) or a consequence of binge eating (Ackard et al., 2003).

Negative affect—The negative-affective pathway is based on the premise that binge eating serves to influence, change, or control negative emotions such as sadness, anger, frustration, loneliness, and boredom. Binge eating dulls these emotions in the short term, thereby reinforcing the behavior despite producing further negative emotions (i.e., shame, guilt, anxiety, and disgust) (Allen et al., 2008; Chen et al., 2009; Stice et al., 2002). Similar to dietary restraint, it is unclear whether a negative affect is an antecedent (Allen et al., 2008; Goldschmidt et al., 2010; Stice et al., 2002) or a consequence of binge eating (Ackard et al., 2003; Goldschmidt et al., 2011), and the relationship is likely to be bidirectional.

Associative Antecedents and Consequences

Much of the research conducted on binge eating among obese adolescents has been associative. Thus, delimitation between antecedents and consequences is not clear. Two such associative factors that have been studied are weight and overeating.

Research has demonstrated that obese children are most at risk for binge eating (Allen et al., 2008; Decaluwé & Braet, 2003a). This is plausible as binge eating is associated with greater energy intake (Tanofsky-Kraff et al., 2009). Yet, some researchers have demonstrated that binge eating prospectively predicts weight gain and earlier onset of overweight among adolescents (Jones et al., 2008; Stice et al., 2002), while Stice et al. (2005) found that binge eating did not predict obesity onset.

Objective overeating, consumption of a large amount of food without a loss of control, has also been considered as both an antecedent and a consequence of binge eating. It has been suggested that overeating progresses to more severe eating pathology including binge eating (Ackard et al., 2003; Claus et al., 2006; Decaluwé & Braet, 2003a). Conversely, it has also been demonstrated that some obese adolescents who binge eat shift to objective overeating over time (Allen et al., 2008).

Surrogate Terms and Related Concepts

Surrogate terms are terms that serve as expressions of the concept of binge eating. Identifying surrogate terms enhances the ability to differentiate binge eating from other concepts. From 1980 to 1990 the term “obese bulimics” was occasionally used (Wadden & Stunkard, 1987). From 1990 to 2011 several authors used the terms “objective bulimic episode” and “objective binge” (Ackard et al., 2003; Allen et al., 2008; Claus et al., 2006; Decaluwé & Braet, 2003a; Goldschmidt et al., 2008c; Goossens et al., 2007; Jones et al., 2008; Tanofsky-Kraff et al., 2007a).

Related concepts are concepts that are related to the concept of interest but do not have the same set of attributes. Concepts related to binge eating that are frequently used but do not meet the full definition of binge eating include objective overeating, subjective binge eating, emotional eating, loss of control eating, eating in the absence of hunger, disordered eating, compulsive eating, and food addiction.

Discussion

This analysis suggests that binge eating as applied to obese adolescents is a dynamic concept. Most authors have clearly articulated the attributes of binge eating as defined in the DSM, creating much homogeneity in terms of the definition of binge eating. Paradoxically, as the concept has developed over time, the nuances and subtleties of the attributes of binge eating (i.e., large amount of food and loss of control) have come to the forefront, prompting questions regarding the salience and relevance of these attributes. Though the core attributes appear straightforward when looking at the definition of binge eating as defined in the DSM, there is ambiguity when operationalizing the concept. Consequently, many researchers have been carefully examining the concept and its attributes. For the optimal advancement of the study of binge eating in obese adolescents further refinement would be ideal.

Though the qualifier of consuming “an amount of food that is definitely larger than most people would eat during a similar period of time in similar circumstances” was added to the DSM definition, determining what most people would eat is difficult. The applicability of this attribute is problematic given the challenges of determining what a “normal” amount of food is for an adolescent. The United States *Dietary Guidelines for Americans* (Dietary Guidelines Advisory Committee, 2010) provides recommendations for healthy eating patterns, but these eating patterns are not the norm. The majority of adolescents do not adhere to these recommendations (Bradlee et al., 2009; Reedy & Krebs-Smith, 2010). Also, most information regarding adolescents’ food consumption is self-reported, and there is poor correspondence between self-report and actual intake (Hill & Davies, 2001; Lichtman et al., 1992). Since practitioners and researchers make social comparisons when determining if an

amount of food is large, contextual and situational factors must also be taken into account when making a determination if the amount of food is large or not. Expected food intake depends on gender, pubertal stage, genetics, ethnicity, activity patterns, and weight status (Bitar et al., 2000; Sun et al., 2001; Troiano et al., 2000). Adolescents should also be asked about their regular dietary intake. Practitioners and researchers must not only consider the quantity of food but also the quality or type of food being consumed. Given the complexity of determining the exact definition of a large amount of food, some researchers have used verbal descriptions or pictures of food to help clarify whether the amount of food would or would not be considered unambiguously large (Goldschmidt et al., 2008a; Jones et al., 2008; Tanofsky-Kraff et al., 2009). Discussions frequently take place among research teams and with other practitioners to delineate if the amount of food is unambiguously large (i.e., Tanofsky-Kraff et al., 2009). Similarly, without further explanation about what a loss of control is, adolescents often have difficulty reporting symptoms (Decaluwé & Braet, 2004).

Though there is a marked consensus in the literature regarding the salience of a lack of control, this concept is abstract and difficult to comprehend, recall, and report without explanation (Decaluwé & Braet, 2004). Researchers and practitioners have described loss of control as a sense of “numbing”, “zoning out”, or “like a ball rolling down a hill, going faster and faster,” (Tanofsky-Kraff et al., 2004, p. 55). These descriptions may help adolescents better comprehend this attribute.

Due to the physical and psychological correlates associated with binge eating, practitioners must identify and properly assess adolescents for binge eating using developmentally appropriate questions. Professionals should be vigilant for potential binge eating and ask about eating behaviors. Obese adolescents who binge eat should be targeted for additional intervention regarding weight management and mental health.

Further research is necessary to continue to develop and examine the concept of binge eating, as well as its antecedents and consequences. Further study of associated attributes of binge eating is also needed to determine additional variables of the phenomenon and associative factors. More research is also necessary on the psychological and physiological pathways of binge eating, as a better understanding of these pathways will allow for development of interventions to prevent and treat binge eating.

Conclusion

During the past 30 years, the concept of binge eating has evolved and become increasingly important amidst the growing obesity epidemic. This concept analysis has identified key aspects of binge eating in obese adolescents. Although there is consensus in the literature that binge eating involves a large amount of food and a lack of control, these attributes are ambiguous. Additionally, the antecedents and consequences of binge eating are complex and multifaceted. These findings demonstrate the need for further refinement of the nuances, subtleties, and use of binge eating in relation to obese adolescents, serving as an important impetus for further research.

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Figure 1.
Flow Chart of Article Selection

Figure 2.
Core Attributes of Binge Eating