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Obesity and eating disorders: an interactive and complex coexistence

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Key words

Obesity
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Weight loss

Abstract

Obesity is the medical condition most frequently observed in people with eating disorders. It often coexists with binge-eating disorder and with some cases of bulimia nervosa, night eating syndrome, and atypical anorexia nervosa. Obesity can precede the onset of eating disorders, sometimes representing a risk factor for their onset, or can be in part the consequence of recurrent binge-eating episodes. Eating disorders and obesity, when they coexist, tend to interact negatively with each other and make treatment more problematic. Weight loss is always contraindicated when obesity coexists with bulimia nervosa and atypical anorexia nervosa. Still, it is not contraindicated when it coexists with binge-eating disorder or night eating syndrome. However, the weight loss outcome with current treatments is often unsatisfactory. A potential strategy to improve this poor outcome is an integrated treatment combining the new incretin-based medications for the treatment of obesity with enhanced cognitive behavior therapy (CBT) of eating disorders and CBT of obesity.

Introduction

Obesity is the medical condition most frequently observed in people with eating disorders. It often coexists with binge-eating disorder and less frequently with bulimia nervosa, night eating syndrome, and atypical anorexia nervosa. Obesity can precede the onset of eating disorders, sometimes representing a risk factor for their onset or partly the consequence of these disorders. A characteristic aspect of this association is a large and significant gender gap. The percentage of women with obesity with a coexisting eating disorder is significantly higher than that found in men (Hudson, Hiripi, Pope, & Kessler, 2007).

This article describes the main eating disorders coexisting with obesity, the interaction mechanisms between the two conditions, and the treatment strategies to adopt.

Binge-eating disorder

The disorder was first described in 1959 by Albert Stunkard to illustrate the characteristics of a subgroup of patients with obesity and recurrent episodes of overeating and uncontrolled eating: a behavior he called binge eating (Stunkard, 1959). However, its existence as a distinct eating disorder was ignored until the second half of the eighties, when some studies on the prevalence of bulimia nervosa in the population found a large subgroup of people who did not use compensatory behaviors (i.e., self-induced vomiting, laxatives and diuretics misuse) after binge eating episodes, as occurs in bulimia nervosa. In the same period, it was observed that about a quarter of individuals seeking treatment for obesity reported recurrent binge eating episodes but did not suffer from bulimia nervosa.

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Subsequent studies have confirmed that binge-eating disorder has distinctive features compared to bulimia nervosa and obesity, but only in 2013 it was recognized as a distinct eating disorder from the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013).

The essential feature of binge-eating disorder is the presence of recurrent binge-eating episodes. This episode is defined as eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstance. To be considered an episode of binge eating, excessive food consumption must be accompanied by a feeling of loss of control (American Psychiatric Association, 2013). One indicator of loss of control is the inability to avoid eating or stopping eating,

The intake of a large amount of food associated with loss of control is also referred to as objective binge eating, to distinguish it from subjective binge eating, where loss of control is not associated with the intake of a large amount of food.

During the binge-eating episode, preference is for foods rich in carbohydrates or fats requiring neither too much preparation to be cooked nor chewing to be taken (e.g., sweets, ice cream, bread, toast, chocolate). If there are no sweets or carbohydrates available, any food can be taken. Some eat only "healthy foods" (i.e., fruits and vegetables), others simply increase the amount of food usually consumed (Fairburn, 2013).

Studies have shown that there is no physical dependence on carbohydrates: what characterizes binge-eating episodes is not the quality of eating but the amount of food consumed - typically between 1000 and 2000 calories (Fairburn, 2013). The high intake of calories with binge-eating episodes explains why, when they are frequent, people tend to gain weight and develop and maintain obesity.

People with binge-eating disorder outside of binge-eating episodes often adopt a dysfunctional eating pattern characterized by a lack of flexible moderation of food intake (Cooper, Calugi, & Dalle Grave, 2019). This pattern of eating includes skipping meals (e.g., breakfast), eating frequently between meals, eating large portions of food, and foods high in saturated fat, sugar, and salt (e.g., hamburgers, sausages, hot dogs, fried potatoes, sugary drinks, processed desserts, pizza, etc.). The dysregulated and excessive eating inevitably leads to daily intake of high amounts of calories that favor the development and maintenance of obesity. Some studies have found that both dysregulated and excessive eating and binge-eating episodes are associated with food insecurity (Abene et al., 2023), defined as a lack of consistent access to adequate food to lead a healthy life.

Finally, it is common for people with binge-eating disorder to intermittently adopt a dysfunctional dietary restriction characterized by extreme and rigid dietary rules to try to lose weight and change the shape of the body. This type of diet favors binge-eating episodes because it is very likely to break the dietary rules when they are rigid, numerous and difficult to follow. In these cases, the individual interprets any dietary transgressions as evidence of their lack of self-control and not of the fact that dietary rules are too rigid and extreme. This favors the temporary abandonment of the effort to control eating ("all or nothing thinking") and the binge-eating episode (Dalle Grave, Sartirana, & Calugi, 2020).

Binge-eating disorder, although also present in normal-weight individuals, is more frequent in those with overweight and obesity. The fact that binge-eating episodes are not followed by the regular use of compensatory behaviors and occur in a context, as reported above, in which there is a dysregulated and excessive eating explains its association with obesity (Fairburn, 2013).

Among people seeking treatment for obesity, between 1.4% and 9% meet DSM diagnostic criteria for binge-eating disorder (Allison et al., 2007; Gorin et al., 2008; Ricca et al., 2000), although in the same population the presence of recurrent binge-eating episodes has been reported with a percentage ranging from 9% to 29% (Allison et al., 2007; Gorin et al., 2008; Ricca et al., 2000). In addition, in people with a Body Mass Index (BMI) ≥ 50.0 requiring bariatric surgery, recurrent binge-eating episodes were found in up to 50% of cases (Vinai et al., 2015). Finally, a large subset of patients seeking treatment for obesity have a low-frequency and/or limited-duration binge-eating disorder.

Table 1.1 shows the prevalence and diagnosis of eating disorders diagnosed with the Eating Disorder Examination interview (Calugi et al., 2015) in 2,810 consecutive patients seeking treatment for obesity to the Department of Eating and Weight Disorders of the Villa Garda Hospital.

Individuals with binge-eating disorder are distressed by their eating behavior and are not happy with the way they look and, often, have low self-esteem. These characteristics can impair psychosocial functioning and negatively affect their physical and psychosocial quality of life (Hay et al., 2023). This was confirmed by NESARC-III, which found that about half of individuals with this disorder reported interference with normal daily activities (Udo & Grilo, 2018). In addition, a quarter of the individuals in this study reported having serious problems fulfilling responsibilities,

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Table 1.1. Prevalence and diagnosis of eating disorders diagnosed in consecutively seeking treatment patients with obesity*

Diagnosis of nutrition and eating disorder	n	%
Binge-eating disorder	184	6,5
Binge-eating disorder with low frequency and/or limited duration	83	3
Bulimia nervosa	23	0,8
Bulimia nervosa of low frequency and/or limited duration	57	2
Absence of eating disorder	2462	87,6
Total	**2810**	**100**

* The diagnosis was made with the interview Eating Disorder Examination (Calugi et al., 2015)

while a fifth reported having problems getting along with others. In another survey, 63% of adults with binge-eating disorder reported impairment in school/work functioning, social life and family life, and nearly 20% reported severe functional impairment (Hudson et al., 2007). The association of the disorder with obesity and depression further aggravates the quality of physical and mental life, respectively (Dalle Grave, 2014). Finally, poor physical fitness was also observed (Mathisen et al., 2018), which seems to be partly negatively affected by both obesity and depression often coexisting with the disorder (Dalle Grave, 2014).

Bulimia nervosa

Bulimia nervosa is a disorder that appeared in the early seventies and was described for the first time in 1979 by Gerald Russell in an article entitled "Bulimia nervosa: an ominous variant of anorexia nervosa" (Russell, 1979). Since 1980, several studies have been carried out to assess its prevalence in the population. The NESARC-III found a lifetime prevalence of 0.28% in samples of the population not seeking treatment (Udo & Grilo, 2018). Although in a 1990 study, only 4.2% of people with bulimia nervosa had a BMI ≥ 25, more recent studies reported an increased risk of bulimia nervosa in people with overweight and obesity (Darby et al., 2009; Zachrisson, Vedul-Kjelsås, Götestam, & Mykletun, 2008), while in the general population, the prevalence seems to be decreasing (Smink et al., 2016).

The disorder mainly affects young women, but it is important to emphasize that bulimia nervosa can affect people of any age, gender, race, and background. The proportion of males with this disorder is uncertain, but it is probably less than one in 10 cases.

In typical cases, bulimia nervosa begins between the ages of 18 and 25, with the adoption of extreme and strict self-imposed dietary rules motivated by concerns about weight and body shape (Fairburn, 2013). About a quarter of the cases had a period in which they met the diagnostic criteria for anorexia nervosa. However, after a certain time, their diet is periodically interrupted by binge-eating episodes followed by compensatory behaviors, such as self-induced vomiting, laxatives and diuretics misuse, fasting or strict and extreme dietary restriction, and/or excessive exercise. The combination of dietary restriction, binge-eating episodes, and compensatory behaviors rarely produces a persistent calorie deficit, which explains why many people with bulimia nervosa are often in the range of normal weight or overweight (Dalle Grave, 2022).

There are few differences between individuals with bulimia nervosa with BMI ≥ 25 and < 25 except for a higher proportion of women belonging to ethnic minorities, lower reported cognitive dietary restriction, and an association between BMI and symptoms of depression in the group with higher weight (Masheb & White, 2012).

Night eating syndrome

Night eating syndrome was first described by Stunkard in 1959 in a 47-year-old woman with obesity (Stunkard, 1959). The DSM-5 classifies the disorder within the diagnostic category of other feeding and eating disorders with specification. It is characterized by recurrent episodes of nocturnal feeding, manifested by eating after waking up from sleep or excessive consumption of food after the evening meal (American Psychiatric Association, 2013). There is the awareness and the memory of having eaten. In addition, nocturnal eating is not better explained by external influences such as the modification of the individual's sleep-wake cycle or local social norms. Night eating causes significant discomfort and/or impaired functioning. Finally, disordered eating patterns are not better explained by binge-eating disorder or another mental disorder, including substance use, and are not attributable to another medical disorder or the effect of medication.

Although the rate of crossover from other eating disorders to night eating syndrome is not established, there is an overlap between this disorder and binge-eating disorder and bulimia nervosa. However, some of the specific features of other eating disorders are not always present, such as consumption of objectively high amounts of food, inappropriate compensatory behaviors, and/or overvaluation of shape and weight (Marshall, Allison, O'reardon, Birketvedt, & Stunkard, 2004).

The prevalence of night eating syndrome has been estimated to be around 1.5% in the general population (Rand, Macgregor, & Stunkard, 1997) and 6-14% in patients with obesity requiring weight loss treatment in non-surgical clinical centers and even higher in surgical ones (Marchesini, Marzocchi, Calugi, & Dalle Grave, 2013). However, the association between night eating syndrome and obesity remains controversial, and some epidemiological studies have found no relationship between the two conditions (Lavery & Frum-Vassallo, 2022; Striegel-Moore, Franko, Thompson, Affenito, & Kraemer, 2006). Discrepancies in prevalence data are likely due to the lack of shared diagnostic criteria for night eating syndrome.

In any case, it is not yet clear whether this disorder precedes and contributes to the development of obesity. A study in individuals with class II and III obesity found no difference between those with and without night eating syndrome in BMI at age 20, current and maximum, and previous weight loss attempts (Calugi, Dalle Grave, & Marchesini, 2009). These data indicate that night eating consumption plays a marginal role in the severity and history of obesity. In contrast, some studies have found that people with night eating and normal weight were younger than people with obesity and night eating. In addition, individuals with night eating reported having had a normal weight before developing this disorder (Marshall et al., 2004).

Atypical anorexia nervosa

A history of overweight or obesity is frequent in patients requiring treatment for eating disorders (Dalle Grave, 2023). Many of these patients are diagnosed with a disorder called "atypical anorexia nervosa." The DSM-5 introduced this new diagnostic category in 2013 for people who meet all the criteria for anorexia nervosa, except that, despite significant weight loss, they have a weight within or above the normal range (American Psychiatric Association, 2013).

Available studies indicate that, compared to people with anorexia nervosa, a higher percentage of males and people of non-Caucasian race suffer from atypical anorexia nervosa (Walsh, Hagan, & Lockwood, 2022). In typical cases, these individuals have a BMI in the range of normal weight or overweight (Walsh et al., 2022). Although malnutrition symptoms may also be present in people with obesity and a high weight loss.

Surprisingly, most studies on atypical anorexia nervosa have not reported the definition of weight loss. However, the threshold most frequently used by research was 10% or more weight loss, although one study, which examined the relationship between three degrees of weight loss (5%, 10%, and 15%), concluded that even a weight loss of 5% is associated with greater psychopathology than controls (Forney, Brown, Holland-Carter, Kennedy, & Keel, 2017). Unfortunately, no studies have provided detailed information on the time course of weight loss. However, this information is of great clinical use, as the rapidity of weight loss is associated with an increased risk of medical complications.

Available data indicate that individuals with atypical anorexia nervosa experience many physical complications associated with anorexia nervosa less frequently but that the severity of eating disorder symptoms (i.e., concern about eating, weight and shape, and dietary restriction) is greater or similar to that of individuals with anorexia nervosa. In contrast, levels of anxiety and depression appear to be similar (Walsh et al., 2022).

Individuals with atypical anorexia nervosa, because they experienced higher weight and a greater frequency of teasing about their weight in childhood and have a higher weight than those with anorexia nervosa, are more likely to experience weight stigma (i.e., social devaluation or "discrediting" because of their weight) by healthcare professionals (e.g., pediatricians, primary care providers, and nutrition and eating disorders specialists) (Dalle Grave, 2023).

Mechanisms of interaction between obesity and eating disorders

Retrospective and prospective research has revealed that premorbid obesity is a potential risk factor for bulimia nervosa, binge-eating disorder, and atypical anorexia nervosa (Barakat et al., 2023; Fairburn et al., 1998; Fairburn, Welch, Doll, Davies, & O'connor, 1997; Stice, Gau, Rohde, & Shaw, 2017). It has been hypothesized that the weight stigma of Western countries puts people with obesity at greater risk of receiving critical comments about their weight and body shape and being discriminated (Dalle Grave,

2022). These negative experiences increase the likelihood of internalizing the "ideal of thinness" and developing unrealistic weight goals and overvaluation of shape and weight. The latter is considered the core psychopathological of most eating disorders because from it derives the adoption of strict and extreme dietary rules, which are often implicated in the onset and maintenance of binge eating and/or undereating and underweight (see Figure 1.1).

When they coexist, eating disorders and obesity interact negatively with each other through several mechanisms (Figure 1.2) (Cooper et al., 2019; Dalle Grave, Sartirana, El Ghoch, & Calugi, 2018a).

1. Obesity increases concerns about shape and weight. It encourages the intermittent adoption of dysfunctional diets and other extreme weight control behaviors, which, in turn, increase the risk of binge-eating episodes.
2. The internalized weight stigma promotes the development of negative emotional states in people with obesity that can trigger binge-eating episodes.
3. Binge-eating episodes promote weight gain, body disasatisfaction and strict dieting.
4. Higher weight is often associated with a reduction in physical activity levels, which contributes to the maintenance of obesity.

The management of obesity associated with eating disorders

Intentional weight loss is always contraindicated when obesity coexists with bulimia nervosa. Indeed, binge-eating episodes are largely maintained by the attempt to adhere to dietary rules to lose weight (i.e., dietary restraint and restriction) (Fairburn, Cooper, & Shafran, 2003). As previously described, people with bulimia nervosa tend to react negatively, often in a dichotomous way, to the almost inevitable breaking of dietary rules adopted to lose weight. Even a small transgression tends to be interpreted as evidence of a lack of self-control and results in a temporary abandonment of the effort to limit the diet, giving rise to an episode of binge eating. This, in turn, maintains the overvaluation of shape and weight by intensifying concerns about the inability to control weight and eating and encourages further dietary restrictions, thereby increasing the risk of other binge-eating episodes. With this in mind, moderate weight loss should only be considered in patients with obesity and bulimia nervosa after a prolonged period of remission from the eating disorder.

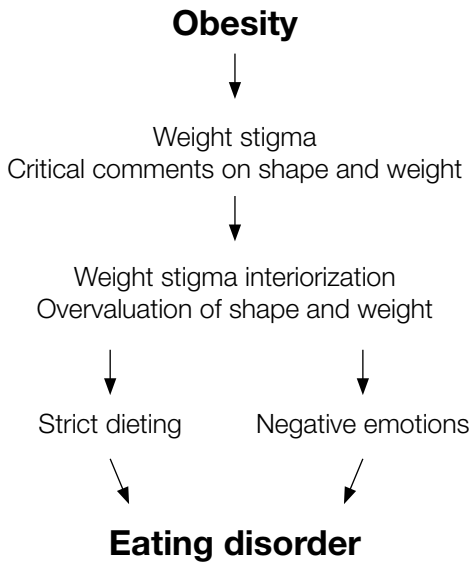

Figure 1.1. Obesity, internalization of weight stigma, overvaluation of shape and weight, and eating disorder

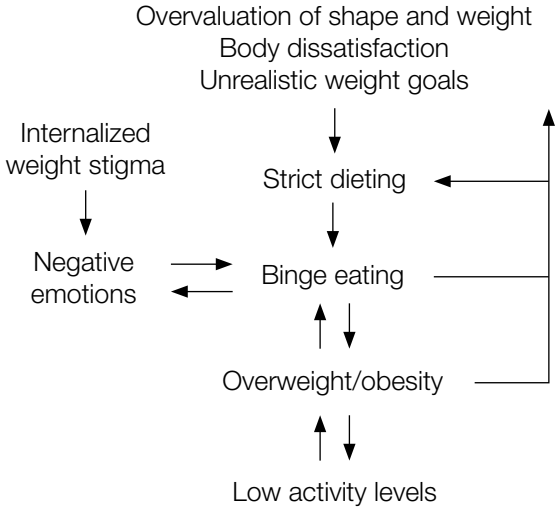

Figure 1.2. Interaction between obesity and eating disorder features

Similarly, the presence of atypical anorexia nervosa associated with an overweight condition contraindicates intentional weight loss because this interventiom intensifies the symptoms of malnutrition already present and the overvaluation of shape and weight.

When obesity coexists with binge-eating disorder, there is no absolute contraindication to weight loss. In recent years, numerous treatments for this disorder derived from those for bulimia nervosa and obesity have been proposed

and evaluated. The effectiveness of cognitive behavioral therapy (CBT) was supported by systematic reviews and meta-analyses (Hilbert et al., 2019), and NICE guidelines recommended CBT as the treatment of choice for this disorder (National Guideline Alliance, 2017). Some research also supports other specialized psychological treatments for binge-eating disorder, particularly interpersonal psychotherapy (IPT) and a form of CBT-based self-help (CBTgsh) (Hilbert et al., 2019). In general, psychological treatments result in the remission of binge-eating episodes in about 50-55% of patients and the improvement of the eating disorder psychopathology and associated depressive condition (Hilbert et al., 2019). These beneficial effects are maintained at 24 and 48 months (Hilbert et al., 2019). Unfortunately, the disadvantage of these treatments is that they generally do not produce significant weight loss (Cooper et al., 2019).

The challenge of helping patients with binge-eating disorder achieve healthy weight loss to manage coexisting obesity has been addressed with various strategies. Behavioral weight loss therapy (BWL) has been evaluated as an alternative to CBT for binge-eating disorder because it produces both modest weight loss and remission of binge-eating episodes. Unfortunately, the effects from BWL on binge-eating episodes are not as well maintained as they occur with CBT, and the weight lost is generally regained (Wilson, Wilfley, Agras, & Bryson, 2010). A recent meta-analysis found that individuals with binge-eating disorder lose less weight and have a 50% higher treatment abandonment rate than those without binge-eating disorder (Forman et al., 2023).

Several medications have been tested in the treatment of the binge-eating disorder, including antidepressants (selective serotonin reuptake inhibitors, serotonin, and norepinephrine reuptake inhibitors, and bupropion), anticonvulsants (topiramate), weight loss agents (sibutramine), and agents for the treatment of substance use disorder (naltrexone) (Citrome, 2019). Although some antidepressants can reduce the frequency of binge-eating episodes, they are often associated with weight gain. Topiramate, while it has been shown to reduce both the frequency of binge-eating episodes and weight, is not recommended because it can have a negative impact on cognitive function.

In 2015, the Food and Drug Administration (FDA) approved lisdexamfetamine (LDX) for the treatment of binge-eating disorder because it was superior to placebo in reducing binge-eating episodes and associated obsessive-compulsive symptoms in three randomized controlled trials (remission of binge-eating episodes after 12 weeks: 36-50% LDX vs. 13-21% placebo) (Citrome, 2015). It should be noted, however, that LDX is a stimulant not available in most countries of Europe and has a "limitation of use," not being indicated for weight loss or the treatment of obesity, and a "black box" with the warning of high potential for abuse/dependence.

A study in 136 patients with binge-eating disorder randomized them to 16 weeks of treatment with placebo, naltrexone-bupropion, BWL, BWL + placebo, and naltrexolone-bupropion + BWL. End-of-treatment binge remission rates were 17.7% in the placebo group, 31.3% in the naltrexone/bupropion group, 37.1% in the BWL+placebo group, and 57.1% in the BWL+naltrexone/bupropion group (Grilo et al., 2022). The logistical regression of binge-eating remission revealed that it was significantly higher with BWL than with the absence of BWL, and that naltrexone/bupropion was significantly superior to placebo. Still, there was no significant interaction between BWL and the drug.

A randomized 12-week trial tested the efficacy of double-blind naltrexone/bupropion for BED with and without obesity and not associating BWL. Eighty-nine patients (70.8% women, 69.7% white, mean age 45.7 years, were randomized to placebo (n = 46) or naltrexone/bupropion (n = 43), with randomization stratified by obesity status and sex; 92.1% completed post-treatment assessments. Naltrexone/bupropion showed no efficacy in reducing binge-eating episodes compared to placebo but showed efficacy in weight reduction in patients with binge-eating disorder. The obesity status did not predict or moderate drug outcomes (Grilo, Lydecker, Jastreboff, Pittman, & Mckee, 2023).

A 17-week randomized, controlled pilot study evaluated liraglutide 3 mg daily in the treatment of binge-eating disorder in 27 participants with a BMI ≥ 27 (Allison et al., 2023). At week 17, participants treated with liraglutide had a significantly greater reduction in binge-eating and weight-loss episodes than placebo. Still, there were no significant differences in the rate of remission of binge-eating disorder (44% and 36%, respectively). An error in the dispensing of drugs in pharmacies was a significant limitation of this study. Preliminary data warrant further research into the use of liraglutide and other GLP-1 agonists for the treatment of binge-eating disorder associated with obesity.

The coexistence of obesity with night eating syndrome is also not a contraindication to intentional weight loss, but available data on treatment effects are limited. In a randomized, double-blind, placebo-controlled trial, 71% of participants assigned to the sertraline group were

classified as "responders" compared to 18% in the placebo group, and participants with overweight or obesity in the sertraline group lost significantly more weight (-2.9 kg versus -0.3 kg in the placebo group) (O'Reardon et al., 2006). CBT adapted for this disorder appears to be potentially effective in addressing eating, sleeping, mood, and stress disorders, a combination of features commonly seen in night eating syndrome (Allison, Lundgren, Moore, O'reardon, & Stunkard, 2010). However, no data exist on the effects of weight loss in individuals with coexisting obesity. Finally, a case-control observational study evaluated the outcome of weight loss in individuals with obesity with or without night eating syndrome in a CBT-OB-based weight loss program that included a first phase of 21-day inpatient treatment followed by a 6-month outpatient follow-up (Dalle Grave, Calugi, Ruocco, & Marchesini, 2011). The time pattern of weight loss did not differ between groups during the study period. At the 6-month follow-up, 51.4% of participants with baseline night eating syndrome no longer reported episodes of night eating in the previous three months. These data indicate that night eating does not hinder the treatment of obesity based on lifestyle modification with an initial phase of hospitalization.

The need of an integrated treatment

To help patients with binge-eating disorder achieve healthy weight loss to manage coexisting obesity, an integrated treatment combining enhanced CBT for eating disorders (CBT-E) with CBT for obesity (CBT-OB) has been developed and it is in course of evaluation (Cooper et al., 2019). CBT-E is the only psychological treatment recommended by NICE guidelines for all diagnostic categories of eating disorders in adults and adolescents (National Guideline Alliance, 2017) and it has proven particularly effective in reducing binge-eating episodes (Linardon, Wade, De La Piedad Garcia, & Brennan, 2017). CBT-OB (Dalle Grave, Sartirana, El Ghoch, & Calugi, 2018b) has been shown to produce significant weight loss in a randomized, controlled trial (Cooper et al., 2010) and a naturalistic study performed in a real-world clinical setting (Dalle Grave, Calugi, et al., 2018). The new treatment is manualized (Dalle Grave et al., 2020) and has the initial goal of helping the patient stop binge-eating episodes and subsequently achieve a healthy weight. These two objectives are pursued by addressing in a personalized and flexible way the factors that maintain binge-eating episodes and obesity. The integrated treatment can also be potentiated by the new incretin-based medications for the treatment of obesity (e.g., semaglutide, terzipatide) that, although they have not yet been investigated in patients with binge-eating disorder, have shown to produce a long-term weight loss between 15% (Wharton et al., 2023) and 20.9% (Jastreboff et al., 2022) in patients with obesity.

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