

Cognitive behavioral therapy to aid weight loss in obese patients: current perspectives

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Abstract: Obesity is a chronic condition associated with risk factors for many medical complications and comorbidities such as cardiovascular diseases, some types of cancer, osteoarthritis, hypertension, dyslipidemia, hypercholesterolemia, type-2 diabetes, obstructive sleep apnea syndrome, and different psychosocial issues and psychopathological disorders. Obesity is a highly complex, multifactorial disease: genetic, biological, psychological, behavioral, familial, social, cultural, and environmental factors can influence in different ways. Evidence-based strategies to improve weight loss, maintain a healthy weight, and reduce related comorbidities typically integrate different interventions: dietetic, nutritional, physical, behavioral, psychological, and if necessary, pharmacological and surgical ones. Such treatments are implemented in a multidisciplinary context with a clinical team composed of endocrinologists, nutritionists, dietitians, physiotherapists, psychiatrists, psychologists, and sometimes surgeons. Cognitive behavioral therapy (CBT) is traditionally recognized as the best established treatment for binge eating disorder and the most preferred intervention for obesity, and could be considered as the first-line treatment among psychological approaches, especially in a long-term perspective; however, it does not necessarily produce a successful weight loss. Traditional CBT for weight loss and other protocols, such as enhanced CBT, enhanced focused CBT, behavioral weight loss treatment, therapeutic education, acceptance and commitment therapy, and sequential binge, are discussed in this review. The issue of long-term weight management of obesity, the real challenge in outpatient settings and in lifestyle modification, is discussed taking into account the possible contribution of mHealth and the stepped-care approach in health care.

Keywords: overweight, BED, ACT, BWL, BWLT, mHealth, virtual reality, chronic care management, stepped care

The obesity pandemic

Obesity, defined as a body mass index of $>30 \text{ kg/m}^2$, is a growing, expensive, and chronic public health problem today, and could be considered an epidemic (globesity).^{1,2} In 2006, the World Health Organization (WHO) estimated that globally >700 million adults will develop the condition of obesity by 2015.^{3,4} The latest data (not estimations) available in the WHO website⁵ are very alarming:

Worldwide obesity has more than doubled since 1980. In 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 600 million were obese. 39% of adults aged 18 years and over were overweight in 2014, and 13% were obese.⁵

Therefore, obesity can be considered one of the most important current health problems affecting millions of people around the world,⁶⁻⁸ including elderly population.^{9,10}

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Moreover, obesity is associated with early death^{11,12} and is typically considered as a risk factor for many medical complications and comorbidities such as cardiovascular diseases, some types of cancer, osteoarthritis, hypertension, dyslipidemia, hypercholesterolemia, type-2 diabetes, obstructive sleep apnea syndrome, and different psychosocial issues and psychopathological disorders.^{8,11-24}

Obesity is a complex disease with a multifactorial etiology: a genetic component (inheritance)²⁵ interacts with individual, familial, behavioral, cultural, and environmental factors that lead to the expression of heterogeneous conditions and results.²⁶⁻²⁸

Treating obesity needs a biopsychosocial approach including medical and lifestyle interventions, psychosocial support, self-management programs, and pharmacological strategies and bariatric procedure if necessary,²⁴ considering a stepped-care framework.²⁹

The importance of psychological variables in managing obese patients

Because obesity is related to psychological variables, clinical psychological interventions and psychotherapies are key elements to engage patients in lifestyle modification and motivate them to achieve weight loss with the help of multidisciplinary teams. Old and new cognitive behavioral techniques are successful strategies among other medical protocols and rehabilitation procedures. Clinical and health psychology can help patients achieve a long-term involvement in sustainable and successful weight loss programs.

Dombrowski noted that

Behavioral factors, ie, poor diet and physical inactivity are among the main proximal causes linked to obesity³⁰, obesity-related morbidity³¹ and mortality^{32,33}

The importance of working on the modifiable factors, especially the psychological ones, to reduce or prevent obesity, is well expressed by Davin and Taylor:

Given the failures of weight loss methods, even surgical methods, an understanding of the psychological variables that impact success of surgical and nonsurgical weight loss is imperative, as the field continues to strive to reduce the public health impact of obesity.⁴

The literature on the psychosocial aspects of obesity has a long history: G. Stanley Hall, the first person to earn a Ph.D. in psychology in the US, started studying eating behaviors and obesity in the nineteenth century, and he could be considered a real pioneer in this field.^{28,34}

The investigation on the psychological aspects of obesity evolved significantly in the following and recent years. Fabricatore and Wadden³⁵ noted that the earliest literature was more focused on psychopathological variables related to a condition of overweight:

The first empirical studies of the matter attempted to find commonalities in the psychological profiles of obese persons. No ‘obese personality’ was ever identified, however. Comparisons of overweight and average weight individuals yielded inconsistent results that depended on the characteristics of the samples.³⁵

Afterward, the identification of risk factors behind psychopathological conditions in obese patients became the focus of research (for example, the gender issue, particularly being a female, was detected as a relevant risk factor). In the last years were largely dedicated to the investigation of the connection between obesity and psychosocial features (for example, in discovering the temporal–causal relationship between psychological distress, depression, and the condition of obesity).³⁵

The etiology of obesity is multifactorial, due to a complex interaction between genetic, behavioral–psychosocial, and environmental factors.²⁶ Behavioral factors, such as dysfunctional eating habits and low levels of physical activity, are typically key variables and are among the main modifiable and proximal causes closely related to obesity-related complications and to simple obesity too.³³

Taking into account the multifactorial etiology of obesity, evidence-based strategies to improve weight loss, maintain a healthy weight, and reduce related comorbidities typically integrate different interventions: dietetic, nutritional, physical, behavioral, psychological, and if necessary, pharmacological and surgical ones. Such treatments are implemented in a multidisciplinary context with a clinical team composed of endocrinologists, nutritionists, dietitians, physiotherapists, psychiatrists, psychologists, and sometimes surgeons.

For the successful long-term treatment of obesity, according to Castelnuovo et al,² psychosocial and psychopathological variables are important elements to consider due to the relevant correlations between obesity and psychological factors such as self-esteem, quality of life, stressful life events, eating disorders, mood problems, anxiety, and personality traits.^{4,36-40} Moreover for the in-patient management of obesity, many psychological treatments with different approaches (psychoeducational, cognitive behavioral, interpersonal, systemic–strategic, psychodynamic, etc) are available.⁴¹

Psychotherapies for obesity typically could help patients achieve weight loss outcome reducing dysfunctional behav-

iors, focusing on cognitive processes, modifying unrealistic weight goals and negative perceptions of body image,^{28,42} and improving psychological skills such as the client's ability to self-monitor (eg, using diaries), stimulus control through restricting quantities of food, and behavioral modification strategies such as chewing slowly, taking time to enjoy food, and increasing awareness of the pleasure associated with taste and food.^{2,28,42,43} Moreover, psychotherapies work on helping patients in maintaining goals that have initially been achieved, preventing possible relapses, and managing critical situations with coping strategies.^{19,33,40,44–46}

Is cognitive behavioral therapy (CBT) the gold standard treatment to aid weight loss in obese patients? A unsolved question complicated by the binge eating disorder (BED)

CBT is traditionally recognized as the best established treatment for BED and the most preferred intervention for obesity,⁴⁷ and could be considered as the first-line treatment among psychological approaches.⁴⁸ Although the comprehensiveness and the practical nature of CBT approach are positive, this psychotherapy does not necessarily produce a successful weight loss.⁴⁹ Traditional medication protocols and psychological treatments have short-term efficacy in comparison with placebo.^{50,51}

Dalle Grave et al described the typical CBT protocol reporting the set of procedures necessary to address weight loss and weight maintenance obstacles.⁵²

In 2004, the National Institute of Clinical Excellence recommended that CBT is the treatment of choice with important empirical evidence of a significant grade (grade A).⁴⁹ According to Grilo et al,⁴⁹

Controlled trials have provided further support for the efficacy of CBT⁵³; however, studies have reported little difference between interpersonal psychotherapy (IPT) and CBT delivered via group⁵⁴ or CBT guided-self-help⁴⁸ [...] CBT generally [...] fails to produce weight loss^{51,49}

So, is CBT clinically effective only in obesity with BED? Does CBT work only on the psychopathology of related eating disorder without reducing specifically and directly the condition of obesity?

First, it is important to take into account that epidemiological studies have indicated BED to be the most common eating disorder^{36,55} and there is a strong association between obesity and BED even if obesity is not a criterion of BED.^{56,57}

There are important differences between obese binge eaters and obese non-binge eaters which are well reported in the study by Vanderlinden et al:

Obese binge eaters often show more severe obesity and greater eating disorder psychopathology (more weight and shape concerns, greater ineffectiveness and body dissatisfaction, more emotional eating, and so on), more negative self-evaluations, and lower self-esteem compared with obese nonbinge eaters^{58–60,57}

Vocks et al, in a comprehensive meta-analysis, noted that in a short period with large effect sizes, CBT can significantly reduce binge eating episodes, promote days without bingeing, manage eating, and reduce shape and weight concerns, without directly affecting body weight.⁶¹ Follow-up studies in order to monitor long-term results are strongly requested.^{57,61–64}

Recently, Cuzzolaro, in a book edited by the Italian Society of Obesity (SIO), summarized the main recommendations and evidences about the relationship between obesity and BED. To identify binge episodes and other disordered eating behaviors is a necessary issue for both medical and surgical treatments of obesity. Moreover, patients with BED–obesity have more psychopathological comorbidity than those without BED–obesity, and hence, more psychological support is requested. Particularly, CBT, interpersonal therapy, dialectical behavior therapy, and with lower evidence, Internet-based guided self-help CBT have been demonstrated to be useful in managing BED and obesity.⁶⁵

Strategies for weight loss in addition to CBT: CBT-E, CBT-Ef, behavioral weight loss treatment, therapeutic education, acceptance and commitment therapy, and sequential binge

According to Fairburn et al, CBT has strongly developed in the management of obesity and eating disorders:

There are two forms of this 'enhanced' treatment (CBT-E): a focused form (CBT-Ef) that targets eating disorder psychopathology exclusively, and a more complex broad form (CBT-Eb) that also addresses certain additional problems – mood intolerance, clinical perfectionism, low self-esteem, and interpersonal difficulties [...].⁶⁶

Behavioral weight loss treatment (BWL) or behavioral weight loss (BWL) typically considers diet, exercise, and behavior therapy, where behavioral modification strategies

usually include self-monitoring, goal-setting, shaping, reinforcement, and stimulus control.^{67,68} BWL interventions are not so efficacious in reducing binge eating episodes in comparison with traditional CBT, but only in a short-term perspective. However, the efficacy of BWLT in obese patients with BED is not so clear. Therefore, more research is needed in order to demonstrate if CBT or BWLT should be considered as the first-line treatment for obesity, taking into account that it is necessary to evaluate the cost-effectiveness too.⁶⁷

Some authors have recently proposed a new interesting weight management protocol in the CBT framework, the Healthy Approach to weight management and Food in Eating Disorders (HAPIFED), which was developed and studied by Palavras et al starting from the CBT-E.⁶⁹

Although therapeutic education is not a form of psychotherapy but a particular multidisciplinary approach, it shares a part of cognitive behavioral background. According to Valerio Miselli in Rotella et al,

Therapeutic education means the therapeutic act continuously characterized by ‘accompanying’ the patient, ‘joining together’ in the path of chronic disease, tending to negotiate [...] for the implementation of measures aimed at achieving the highest possible clinical outcome and the best perceived quality of life [...].⁷⁰

Another important development of the traditional CBT approach for obesity is the “third-wave” CBT protocols, such as the acceptance and commitment therapy (ACT).^{71–73} ACT can enhance weight loss behaviors through the integration of

[...] self-regulation skills that are reflected in acceptance-based treatment, ie, tolerating discomfort and reduction in pleasure, enacting commitment to valued behavior, and being mindfully aware during moments of decision-making.⁷³

It is relevant to distinguish the mindfulness-based part of the ACT protocol from the more CBT-based component, because they impact differently on the weight loss issue. According to a recent meta-analysis about mindfulness-based interventions for adults who are overweight or obese, ACT produced significant effect only in reducing weight, while mindfulness approaches produced important effects on different psychological health variables and eating-related factors, so the conclusion of this meta-analysis is that

Mindfulness-based interventions may be both physically and psychologically beneficial for adults who are overweight or obese, but further high-quality research examining the mechanisms of action are encouraged.⁷⁴

A last promising proposal in the behavioral framework, specific for the reduction of binge eating episodes, is the sequential binge (SB) approach proposed by Neveu et al:

We present the sequential binge (SB), a new behavioral intervention that complements CBT. The SB intervention consists in replacing patients’ usual pattern of food ingestion during a binge by a repeated monotonous food ingestion sequence, interspersed with short incremental pauses.⁷⁵

This approach includes some strategic prescriptions and techniques typical of a systemic–strategic background more than a cognitive behavioral framework.^{76–78}

CBT in the long-term weight management of obesity: the real challenge in outpatient settings and in lifestyle modification

As underlined before, most evidence-based psychological treatments, and in particular CBT, are not so successful in aiding weight loss.⁶¹ BWLT can produce weight loss in the presence of BED, but the weight regain is common.^{69,79}

The long-term weight management of obesity is a very complicated task with a high possibility of failure and risk of weight regain. Montesi et al reported the most important factors that allow a successful management of weight loss in the long term too, considering observational and randomized studies as the source of information:

A few (factors) pertain to the behavioral area (eg, high levels of physical activity [...]), a few to the cognitive component (eg, reduced disinhibition, satisfaction with results achieved [...]), and a few to personality traits (eg, low novelty seeking) and patient-therapist interaction.⁸⁰

For these authors, it is necessary to consider a lifestyle modification-based approach for the management of obesity, including a nonphysician healthy lifestyle counselor-trainer as the point of reference in the multidisciplinary team.⁸⁰ The importance of multicomponent programs in outpatient settings and primary care contexts is also underlined by Kelley et al: in order to motivate and support patients, it is recommended

[...] a combination of nutritional, physical activity, and cognitive behavioral approaches to target overweight/obesity. The focus is on behavioral approaches and practical applications, such as motivational interviewing techniques.⁸¹

A complete description of the three main components of lifestyle modification for weight loss in a CBT framework

is given in the study by Dalle Grave et al⁸² that described the evolution of behavioral therapy for weight loss, from a behavior-centered approach, to a more cognitive attitude and then to a multicomponent treatment:

Modern lifestyle modification programs have three main components: dietary recommendations; physical activity recommendations; and cognitive-behavioral therapy to address weight loss and weight maintenance obstacles [...]. These components interact with each other, each contributing to the final success of treatment.⁵²

The diet is typically designed to produce a calorie deficit in order to achieve the first step of weight loss (for example, 1 kg per week) and then to maintain a functional weight in a flexible range as the second step. The physical activity consists in period exercises such as walking (for example, with goals to gradually achieve 10,000 steps per day) that can achieve a calorie deficit particularly useful for producing weight loss and enhancing muscle mass. The cognitive behavioral component of the lifestyle modification can motivate patients in their adherence to diet and exercise and can provide a set of procedures and strategies such as self-monitoring during eating, realistic and achievable goal setting, control of dangerous stimuli and triggers and promotion of alternative behaviors during critical emotional situations or negative mood states.

As previously underlined, important limitations in the multidisciplinary chronic care management of obesity concern the difficulty associated with maintaining long-term compliance and adherence, which are the variables necessary to ensure clinical efficacy.²

In fact, most overweight and obese individuals regain about one third of the weight lost with treatment within one year and they will typically come back to baseline in three to five years.⁸³

Assessment and enhancement of patients' motivation, compliance, and engagement is a strategic issue for a successful treatment of obesity and its comorbidities.^{84–86} The transtheoretical model of change^{87,88} that describes five motivational stages through which patients necessarily evolve trying to change their dysfunctional behaviors could be useful in weight loss too. Motivational interviewing (MI) and motivational enhancement therapy are other potential steps forward in comparison with the transtheoretical model.^{89,90}

Particularly, MI has been demonstrated to be effective in promoting behavioral change through a nonjudgmental approach and a style of communication that enhances patient's competence, autonomy, and intrinsic motivation.⁷⁸

In order to achieve a long-lasting behavioral change engaging people in a healthy attitude, the ambivalence regarding change is considered and discussed in MI, avoiding too much rigidity in directive prescriptions.^{91–93} The functional use of MI requires clinicians with enhanced skills who can go beyond a traditional style of consultation. The approach is not educational but aims at moving patients toward self-motivational strategies improving readiness to change.⁹⁴

CBT and mHealth: the integration of Internet-based technologies into psychological and multidisciplinary protocols according to a stepped-care approach

mHealth is a new technological opportunity in the health care scenario and could be briefly defined as the delivery of preventive, monitoring, or clinical procedures and protocols through the mobile communication devices, such as mobile phones, tablets, personal computers, personal digital assistants, biosensors, and other up-to-date technological devices.^{15,95–102}

Clinical procedures that include mHealth-based components could overcome some limitations typically connected to the traditional chronic care management of obesity through the enhancement of weight reduction in remote settings with better long-term efficacy and effectiveness across clinical, organizational, and economic perspectives.^{68,103–105} Many articles have been published showing the utility of mHealth devices in promoting healthy habits, weight loss reduction, and functional management of comorbidities.^{16,97,103–119} One interesting telephone-based CBT intervention, planned to improve eating and psychosocial functioning, has been tested in a preliminary study by Sockalingam et al.¹²⁰ Another interesting project was the positive online weight reduction, a web-based weight management intervention focused on supplementing a telephone-based support in web-based obesity treatment protocols.¹²¹ Many of these interventions include cognitive, behavioral, or cognitive behavioral techniques compatible with a CBT approach. Moreover, the mHealth applications have achieved positive results in adult obesity^{118,122} and in childhood obesity too.^{116,123} Even if evidence is growing in mHealth for obesity, organizational, technological, economical, and philosophical barriers for its development are still present as underlined by Mohammadzadeh and Safdari.¹²⁴

CBT and other psychological approaches have to improve and test monitoring and treatment protocols for obesity

and overweight with or without new technology-based devices,^{125,126} not forgetting the basic principles of communication with each patient even in an mHealth scenario.^{127–130}

One of the up-to-date approaches in the management of obesity is delivering CBT or cognitive behavioral techniques in traditional and innovative settings for each step of the cost-effective stepped-care approach,^{29,101,131} as proposed by Castelnuovo et al:

[...] the lower level of treatment could be simply a mhealth or traditional based lifestyle psychoeducational and nutritional approach [...] the following step [...] could be [...] health professionals-driven multidisciplinary protocols [...] then the inpatient approach with the inclusion of drug therapies [...] finally the solution of bariatric surgery [...].²

Another current and future scenario where CBT could be improved in the management of obesity is represented by virtual reality (VR) applications, such as the VR-enhanced CBT that is a sort of enhanced CBT of obesity with a VR module focused on unlocking the negative memory of the body, changing its dysfunctional behavioral correlates, and managing negative emotional states.¹³² Riva et al have strongly demonstrated the utility of VR in weight reduction protocols.^{133–142}

Disclosure

The authors report no conflicts of interest in this work.

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