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17.1 Introduction

The purpose of this chapter is to review mindful eating interventions for adults with severe obesity. Mindfulness interventions that specifically target problematic eating behaviors such as overeating, binge eating, grazing, and emotional eating¹ will be the focus of this chapter rather than mindfulness interventions like mindfulness-based stress reduction [1] or mindfulness-based cognitive therapy [2, 3] that are used with other mental health conditions like depression and anxiety. Also, we will not include integrative interventions such as acceptance and commitment therapy [4] or dialectical behavior therapy [5], which incorporate mindfulness into protocols that are primarily focused on skills and tech-

niques to increase acceptance and skillful regulation of emotion.

Case Vignette

Betty is a 59-year-old, married Caucasian Canadian female with type 2 diabetes, osteoarthritis, obstructive sleep apnea, hypertension, and lower back pain. At a height of 159 cm and a weight of 78.18 kg, her Body Mass Index (BMI) is 30.50. She has struggled with obesity and yo-yo dieting since her mid-twenties. While Betty reported losing weight through various commercial weight-loss programs in the past, she would often regain all the weight back and more. She further endorsed eating large portions and a history of binge eating since her mid-twenties in response to interpersonal stressors. She estimated that her lowest adult weight was 78.38 kg and her highest was 113.4 kg when she was 21 and 45 years old, respectively.

Betty reported losing approximately 15 kg 1 year ago in the span of 4 months by making healthier food choices and exercising three to four times per week, including swimming, strength training, and gentle

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¹The term *problem eating* will be used to refer to eating and overeating in response to cues other than physical hunger and past the point of satiety, including painful or aversive emotions, grazing or frequently eating small amounts of food throughout the day, night eating, and dysregulated or chaotic eating patterns characterized by irregular meal times such as eating once per day or an absence of regular meal times.

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hatha yoga. However, in the past 6 months, she reported engaging in a two binge eating episodes per week to help her cope with her mother's declining health. Furthermore, she has a difficult relationship with her older brother. Her distress over this relationship prompts her to eat to self-soothe, and she tends to eat in secrecy because she is ashamed of overeating. She also stopped exercising and grazed on bread, crackers, or nuts when she was bored, sad, or feeling overwhelmed. She described feeling "out of control" of her eating at times, grazing during the day and going back for additional portions of food at mealtimes even though she was no longer hungry. Betty did not present with extreme dieting behaviors such as vomiting, laxative abuse, fasting, or excessive exercise to compensate for her eating.

Betty currently lives with her husband of 34 years and described their relationship as loving and supportive. She has three adult children who live on their own. Her highest level of education is a university degree in economics. She has been retired for 4 years after working as a senior manager at an insurance brokerage firm for 15 years. Betty noted that she is the primary caregiver to her aging mother who has dementia. Her husband also expressed concern that Betty avoids dinner invitations or gatherings with their friends or extended family for fear of being criticized about her eating or weight.

At intake, Betty reported some anxiety regarding her weight and longevity and she was tearful when talking about her mother and brother. She completed eight sessions of individual psychotherapy 2 years ago. She is currently on escitalopram for anxiety symptoms and trazodone for sleep.

She enrolled in a ten-session Mindfulness Based Eating and Awareness Training (MB-EAT) program. Her goals were to lose an additional 3–5 kg and hopefully improve blood sugar control by controlling emotional eating and overeating.

17.2 The Roots of Mindful Eating Interventions

In recent years, the topic of mindfulness has experienced a surge in publication in both the popular and academic press, particularly in psychotherapy research [6]. While over the past 30 years a significant amount of scientific research has been devoted to examining the efficacy of mindfulness-based interventions (MBIs) and this research is described below, it is important to acknowledge the many mindful eating books and programs for general audiences that have not been evaluated through research. Patients and practitioners may find these selected books helpful as resource guides.

Mindfulness meditation techniques are practices that aim to improve control over one's attention and the ability to focus. This training is done with an attitude of acceptance and without judgment or interpretation of thoughts, feelings, and sensations [7]. Practitioners train by focusing on stimuli like their own breathing, bodily sensations, sights, sounds, thoughts, and emotions [1, 8]. Many mindfulness exercises can be practiced while sitting or lying down in a relaxed posture, or while engaged in routine activities such as walking and, especially important for our purposes, eating. Regular practice of mindfulness facilitates increased self-awareness and self-acceptance and reduced reactivity to passing thoughts and emotions, thereby improving one's ability to make adaptive choices when experiencing painful emotions or difficult situations [5].

Mindfulness is rooted in Eastern contemplative traditions and is the proposed "heart" of Buddhist meditation [9]. In Buddhist traditions, mindful eating is considered a fundamental aspect in a way of living that helps prevent unnecessary harm to one's body and mind [10]. In *Savor: Mindful Eating, Mindful Life*, Zen Master Thich Nhat Hanh and Harvard nutritionist, Dr. Lilian Cheung applies Buddhist teachings on The Four Noble Truths to understanding eating problems, obesity, and the achievement of a healthy weight. The Four Noble Truths are a framework that identifies recurrent dissatisfaction and at times suffering as the primary ailment

of the human condition [11]. Suffering, here, is considered noble because it motivates individuals to gently investigate it and to be open to the possibility for change. According to Hanh and Cheung [12], The Four Noble Truths of Healthy Weight are (1) being overweight or obese is suffering; (2) you can identify the roots of your weight problem; (3) reaching a healthy weight is possible and suffering can end; and, (4) you can follow a mindful path to a healthy weight. Furthermore, it is the awareness of the present moment, and the insight that comes from investigating *why*, *what*, and *how* individuals eat, that make changing problem eating possible. Many Buddhist teachers recommend that individuals integrate mindfulness with eating as a way to become fully present in the moment with all aspects of daily life, including walking, working, sitting, talking, preparing food, serving, and much more [13, 14].

Dr. Jan Chozen Bays is a pediatrician and a Zen Priest who has been teaching meditation since 1985. In her book, *Mindful Eating: A Guide to Rediscovering a Healthy and Joyful Relationship with Food*, Bays [14] describes seven types of hunger: eye hunger, nose hunger, mouth hunger, stomach hunger, cellular hunger, mind hunger, and heart hunger. These concepts are also taught in *Mindful Eating-Conscious Living* (ME-CL), a nine-session program that focuses on helping individuals struggling with disordered eating and body image issues reestablish a healthy and pleasurable relationship with food and eating. Instead of focusing on weight loss and dieting, Bays' approach encourages participants to engage with all of their senses, cultivate awareness, and to bring loving-kindness and compassion to their everyday lives, including suffering (First Noble Truth).

17.3 Rationale for Mindful Eating Interventions

Now that MBSR and MBCT have been evaluated in many clinical settings for over a decade, research aimed at identifying the mechanisms of change in these interventions has been conducted

[15]. Consistent evidence has been found that these mechanisms include a decrease in cognitive and emotional reactivity, increased mindfulness and decreased repetitive negative thinking, and increases in self-compassion and psychological flexibility. Moreover, mindfulness and decreased repetitive negative thinking have been found to be significant mediators of the impact of these interventions on clinical outcomes. While this research has not yet been conducted for mindful eating, we can speculate that similar change processes may be at work.

The ability to change habits is key to weight loss, yet this is a surprisingly complex and difficult task that involves becoming aware of and changing many thoughts, beliefs, behaviors, and emotions related to eating and one's self. These include the type of food, when the food is eaten and with whom, and in what setting or situations. Monitoring and changing these behaviors in the face of fatigue, daily stressors, painful emotions, and unexpected events can be extremely challenging, especially long term [16]. The high-calorie, highly palatable processed convenience foods that are easily accessible and heavily advertised in most developed nations makes these tasks even more difficult. The rationale for mindful eating as an intervention for obesity begins with the understanding that mindfulness practice helps develop an awareness of and acceptance of these challenges and one's responses to them, thereby increasing the odds of making skillful decisions. Unlike traditional diets that provide externally imposed rules about what, when, and how to eat, mindful eating is an "inside out" approach that begins with enhancing awareness of one's personal experience with food and eating. Please see Checklist 1 for a summary of mindful eating principles.

In contrast, mindless eating entails eating without awareness and not prompted by physical hunger, in response to food and eating-related cues such as the size, shape, aroma, and color of food or food packaging and situational distractions or pressures such as social events or people [17]. In fact, in a study investigating the impact of environmental cues on eating-related decisions, Wansink and Sobal [17] found that individuals

made 227 eating and beverage-related decisions per day but were only aware of 14 of these. Obese participants made more decisions than overweight or normal weight participants though the difference between obese and normal weight participants was not statistically significant. When the size of servings and serving containers was manipulated, participants underestimated how much they actually ate.

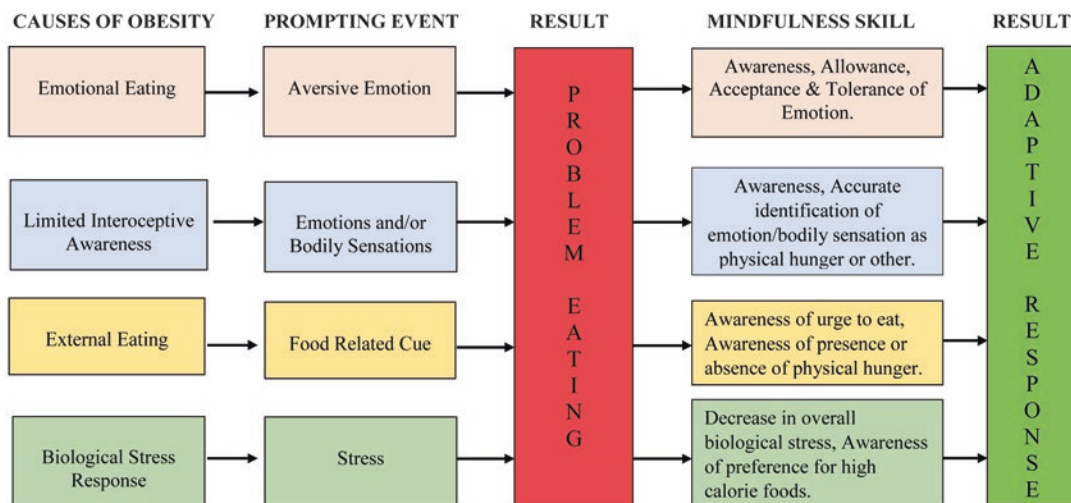
While not every person who is obese has an eating disorder, obese individuals have been found to have higher rates of binge eating disorder (BED) and night eating syndrome (NES) in comparison with those who are not obese [18, 19]. The overeating and nocturnal eating characteristic of these disorders or the subclinical versions of these disorders can contribute to weight gain. In the mindful eating approach to obesity, emotion dysregulation is seen as an important underlying cause of binge eating and other types of problem eating: when experiencing painful emotions, individuals with problem eating overeat or eat impulsively, often with disregard to physical hunger, as an emotion avoidance strategy [20]. Excess calories may thus be consumed in an automatic or dissociative manner [21], thus leading to weight gain over time. This eating may occur with or without prior conscious intent and decision-making [22], further strengthening the rationale for improving mindful awareness of eating as a route to improving eating behavior.

A model of emotional schemas proposed by Leahy [23] suggests that individuals who label their emotions as pathological or aversive may attempt to reduce awareness of their emotional states through impulsive behaviors such as substance use, dissociation, or binge eating. Mindfulness practice counters this tendency by facilitating an acceptance and understanding of painful emotions. Because mindfulness training involves purposeful and sustained attention to internal dialogues, emotions, and bodily cues, patients learn to recognize and allow and tolerate aversive affect without engaging in problematic eating. Evidence for this model has been found in the significant relationship between levels of emotional eating and weight loss success: successful weight control was associated with decreases in

emotional eating between baseline and a 1-year follow-up and with low levels of emotional eating at both time points. In contrast, unsuccessful weight control was associated with increases in emotional eating between baseline and follow-up and with high levels at both time points [24].

In addition to empirical support for the affect regulation model, research also suggests that individuals with eating disorders have limited interoceptive awareness [24]. Repeated past diets that teach people to rely on external rules for eating may lead to the loss of one's ability to recognize, accept, or respond to internal cues of hunger, taste, satiety, and fullness [25–27]. This is supported by research identifying the environmental cues that contribute to mindless eating and underestimation of portion sizes [17]. On questionnaire measures of external eating (the tendency to eat in response to the taste, sight, or smell of palatable food), a positive relationship has been found between BMI and obesity [24, 28–30]. Such measures have also been associated with retrospective accounts of adult weight gain [31, 32] and to predict weight regain following weight loss [33].

It is possible that these observations are linked [34]: over time, persistent attempts to avoid or reduce emotions may result in a decreased awareness of internal states. Conversely, a low baseline level of interoceptive awareness may result in elevated distress during intense emotions and an increased likelihood of using avoidant coping strategies like binge eating. Regardless of the directionality of the association, increasing interoceptive awareness may be an important component of treatments targeting affect regulation [35–37]. One study which investigated the link between participants' dispositional mindfulness and eating behavior found that dispositional mindfulness was associated with more restrained, and less emotional and external eating behavior in obese outpatients, above and beyond depression and anxiety symptoms [38]. This finding strengthens the premise that increasing mindfulness may lead to decreased problem eating, and thereby weight loss and/or healthier food choices. Please see Kristeller and Epel [39] for a detailed review of



Flow Chart 17.1 Summary of mechanisms of change for mindful eating interventions

the theory and research underpinning the use of mindful eating for individuals who are overweight or obese and struggle with problem eating.

In addition to the links between emotion dysregulation/avoidance and externally cued eating with problem eating, a complementary rationale for mindful eating may be found in our understanding of the body’s biological stress response, which has been associated with increased feelings of hunger, preference for high-fat and high-sugar foods, and abdominal fat deposition [40]. Thus, another mechanism for mindfulness meditation’s effectiveness may be through its ability to attenuate the biological stress response and improve adaptive responding to stress. Please see Flow Chart 17.1 for an illustration.

after MBSR and MBCT and as such are usually delivered in multi-session closed groups to allow participants to share their experiences and for delivery of the intervention to multiple individuals at one time.

Outcome research that measures change in BMI, eating behaviors, and psychological correlates such as anxiety and depression has been published on several mindfulness-based treatments for eating disorders and problem eating. These are summarized below. Based on the description of treatment in these papers, they appear to share common practice elements such as mindful breathing and eating, body scan meditations, gentle yoga, didactics about healthy eating, and eating-related CBT techniques. Interventions that specifically incorporate mindful eating into all or most sessions should be used with individuals with eating concerns, as compared with mindfulness interventions such as MBSR and MBCT that do not have this specific focus [44].

Mindful eating interventions tend to encourage moderation in food choices and the inclusion of small portions of the high-fat, high-sugar, and high-salt foods that individuals typically binge on. These foods are used in mindful eating practice so participants learn to eat them slowly and with full awareness [45]. This is in contrast to typical diets that exclude certain foods or food group and to the

17.4 Outcome Research

17.4.1 Overview

Mindfulness approaches have been shown to be effective treatments for psychological and physiological symptoms in patient populations including depression, anxiety, and stress [41, 42] with moderate effectiveness [43] and the body of research evidence for specific mindful eating interventions is preliminary but promising. Mindful eating interventions tend to be modeled

food addiction model, which advocates abstaining from “addictive” foods [46].

Mindful eating interventions incorporate a variety of therapeutic components, making it difficult to identify which component or components are responsible for clinical outcomes. So far, dismantling studies, which seek to compare a treatment with and without elements that are purported to be of therapeutic benefit, have not been done. Therefore, it is difficult to establish the superiority of any one treatment protocol in particular, especially without the availability of detailed protocols. The main exception to the

lack of protocol availability is Mindfulness-Based Eating Awareness Training (MB-EAT) developed by Kristeller and Hallett [47] to treat binge eating disorder and related problem eating. At this time, MB-EAT is the only research-based mindful eating protocol that is disseminated in its entirety through organized teacher-training courses. MB-EAT is also the mindful eating protocol that has generated the greatest number of publications [21, 47–49]. Please see Table 17.1 for a summary of the components of mindful eating-related mindfulness exercises used in MB-EAT.

Table 17.1 Components of MB-EAT: principles and related exercises (Kristeller & Wolever, 2011)

Concept/principle	Component	Session	Exercise
<i>1. Cultivating mindfulness</i>			
(a) Cultivate capacity to direct attention, be aware, disengage reactivity, and be nonjudgmental	(a) Mindfulness meditation practice	1–10	(a) Sitting practice in session. Meditation homework
(b) Cultivate capacity to bring mindfulness into daily experience, including eating	(b) “Mini-meditations.” General use of mindfulness	2–10	(b) “Mini-meditation” use. Brief practice in all sessions
(c) Cultivating/engaging inner and outer “wisdom”	(c) Meditation practice/ mindfulness in daily life	All sessions	(c) Encouragement of insight. Wisdom meditation (Session 10)
<i>2. Cultivating mindful eating</i>			
(a) Bring mindful attention and awareness to eating experience. Recognizing mindless eating	(a) Meditation practice. Mini-meditations. Chain reaction model	1–10	(a) Wide range of practices (see below for specifics)
(b) Cultivate taste experience/ savoring and enjoying food	(b) Mindfully eating raisins. All mindful eating experiences	1, 2, 4, 6, 7, 9	(b) Raisins: cheese and crackers; chocolate; fruit and veggies; “favorite food”; pot-luck/buffet homework
(c) Cultivate awareness of hunger experience	(c) Hunger awareness	3	(c) Hunger meditation; homework
(d) Awareness and cultivation of sensory-specific satiety/taste satisfaction	(d) Training in sensory-specific satiety, both in and out of session	4, 7	(d) Taste satisfaction “meter”
(e) Making mindful food choices, based on both “liking” and health	(e) “Inner wisdom” and “outer wisdom” in regard to food choice. Mindful decrease in calories	2, 4–6, 7	(e) Choice: chips, cookies, or grapes. Mindful use of nutrition info. 500 Calorie Challenge. Managing social influences
(f) Awareness and cultivation of fullness experience	(f) Mindfully ending a meal	1–6	(f) Fullness awareness/ ratings
(g) Awareness of negative self-judgment regarding eating. Cultivate nonjudgmental awareness of eating experience	(g) Eating challenging foods. Identifying cognitive distortions	2–6, 9, 10	(g) Identifying “black and white” thinking; “surfing the urge”

(continued)

Table 17.1 (continued)

Concept/principle	Component	Session	Exercise
<i>3. Cultivating emotional balance</i>			
(a) Cultivate awareness of emotions and emotional reactivity	(a) Learn to identify and tolerate emotional triggers	3–5, 9, 10	(a) Mindfulness practice; chain reaction model; mini-meditations
(b) Meeting emotional needs in healthy ways	(b) Behavior substitution; modifying comfort eating	Most sessions	(b) Emotional eating visualization. Savoring food
<i>4. Cultivating self-acceptance</i>			
(a) Acceptance and non-self-judgment of body/self-regulation/gentle exercise	(a) Relationship to the body	1, 3–5, 8	(a) Breath awareness; body scan practice; healing self-touch; chair yoga; pedometers; mindful walking
(b) Recognition of anger at self and others. Acceptance of self/others	(b) Exploring feeling and thoughts toward self and others	4, 5, 10	(b) Loving kindness meditation. Forgiveness meditation. Discussion
(c) Recognizing and engaging capacity for growth. Self-empowerment	(c) Cultivating and honoring wisdom in self	All Sessions	(c) Wisdom meditation. Discussion throughout

17.5 Mindful Eating for Problem Eating

Recent reviews have concluded that mindfulness approaches can improve outcomes in individuals with problem eating [50, 51]. In interventions ranging from 1 to 24 sessions and with 7–150 participants, mindfulness practice effectively decreased binge eating and emotional eating in populations engaging in this behavior. These interventions have been used with both patient and non-patient participants and with overweight and obese participants.

In any early outcome study, Kristeller and Hallett [47] used MB-EAT with 18 overweight/obese women (average BMI=40) with binge eating disorder. They found a significant improvement in participants' perceived control of eating and awareness of hunger and satiety cues. After the seven session intervention run over 6 weeks, only four participants still met criteria for BED and remaining binges decreased substantially in size. There were no significant changes in weight however, prompting the authors to incorporate more information and skill building regarding nutrition and food choices in future groups.

The amount of time participants practiced mindfulness was related to outcomes. Since the publication of this study, several others have been run and disseminated.

For example, Daubenmier et al. [52] investigated the use of a mindful eating intervention with 47 overweight/obese women who were randomly assigned to a 4-month intervention or a wait list group to explore effects of a mindful eating program for stress eating. Participants improved in mindfulness, anxiety, and externally based eating but did not differ on average cortisol awakening response (CAR), weight, or abdominal fat over time. However, obese treatment participants showed significant reductions in CAR and maintained body weight while obese control participants had stable CAR and gained weight. Improvements in mindfulness, chronic stress, and CAR were associated with reductions in abdominal fat.

In a follow-up study, Kristeller et al. [53] conducted an RCT of MB-EAT for 150 individuals with an average BMI of 40.3, 66% of whom met DSM-IV-TR criteria for BED. The comparison groups were a psychoeducational/cognitive behavior intervention and a wait list control. Weight management was briefly discussed in

both the psychoeducation and MB-EAT groups but were not the focus of either treatment. The MB-EAT and psychoeducation participants showed comparable improvement after 1 and 4 months post-intervention on bingeing and depression. At 4 months posttreatment, 5% of those who had met criteria for BED in the MB-EAT continued to meet criteria for BED, compared with 24% of those in the psychoeducation group. Amount of mindfulness practice predicted improvement on weight loss and other variables. In terms of weight loss, 29% in the psychoeducation group and 38% in the MB-EAT group lost 5 lbs or more during the course of the study. There was an overall pattern of larger effect sizes for the MB-EAT group as compared to the psychoeducation group on measures of reactivity to food including disinhibition and hunger, indicating greater self-regulation and behavioral control in the MB-EAT group.

Bush et al. [54] developed a 10-week group intervention integrating mindfulness and intuitive eating skills for 124 female employees at a university. Participants with anorexia and bulimia were excluded. The goal of the intervention was to reduce body dissatisfaction and decrease problematic eating behaviors. Participants in the treatment condition in comparison to wait list controls reported higher levels of body appreciation and lower levels of problem eating. In addition, mindfulness scores served as a partial mediator of change in outcomes.

Finally, Kidd et al. [55] used an 8-week mindful eating group intervention to investigate changes in mindful eating, self-efficacy for weight loss, depression, weight loss, body fat, and blood pressure in 12 obese women who lived in an urban area. A focus group was conducted afterwards to understand the participants' experiences with mindful eating. The only measured variable that improved statistically was self-efficacy over weight loss. Thematic analyses of the focus group content confirmed increased self-efficacy over weight loss, and the participants described improvements in mood, food choices, and eating behavior. Those who reported applying mindfulness skills reported

the greatest change in BMI, mental health, and decreased emotional eating.

17.6 Mindful Eating for Weight Loss

While evidence that mindful eating improves problem eating is consistent across studies and various participant populations, evidence for weight loss is mixed. Mindfulness interventions that do not integrate nutrition information or weight management guidance tend not to produce weight loss. Not surprisingly, of those mindful eating studies that did incorporate weight-loss strategies and where weight loss is a goal, participants lost weight [56, 57].

For example, Dalen et al. [56] developed a 6-week group protocol that combined mindfulness meditation, nutrition information, light yoga, walking meditation, group eating exercises, and group discussion along with brief daily meditation and mindful eating practice for homework. They assessed changes in BMI, eating behavior, psychological distress, and the physiological makers of cardiovascular risk in their ten participants. Post-intervention, participants reported statistically significant increases in mindfulness and cognitive restraint around eating as well as statistically significant decreases in weight, binge eating, depression, and C-reactive protein.

Out of the ten intervention studies on mindful eating reviewed by Katterman et al. [50] that measured weight as an outcome, six provided education on energy balance, nutrition, or exercise, and only one included behavioral weight loss techniques such as problem-solving and encouraging behavioral goal-setting [58]. Among the interventions where weight loss was observed, weight loss served as a primary outcome of the intervention and treatment included either nutrition education alone [56, 57] or nutrition education plus teaching behavioral strategies [58]. Thus, while weight loss may occur when it was a primary outcome, there is no evidence that weight loss occurs in response to mindfulness training in the absence of a specific focus on weight.

17.7 Mindful Eating with Bariatric Surgery Patients

Obese individuals who pursue bariatric surgery report high rates of problem eating including loss of control over eating, binge eating, and chronic overeating [59, 60]. Even when individuals do not meet full criteria for an eating disorder, these disordered eating patterns can prevent optimal adherence to postsurgical eating guidelines, thus contributing to eventual weight regain [61–63]. While the first year after surgery for most patients is characterized by rapid weight loss, once patients transition to weight maintenance, presurgery eating problems may recur. About 20% of postoperative patients experience insufficient weight loss [64], frequently defined as less than 50% excess weight loss [65–67].

Given that weight loss with bariatric surgery is associated with the improvement or resolution of medical comorbidities as well as improvements in patient-reported quality of life [68], weight regain is of primary concern for these patients, their families and health care providers. In one study following gastric bypass patients over an average of 28 months, 79% regained some weight after reaching their lowest weight and 15% experienced a weight increase of 15% or more from their lowest weight [69]. Eating-related factors associated with weight regain include binge eating [27], lack of control over food urges, [69] and eating in response to painful affect [70, 71], making mindful eating appropriate for this population too. Indeed, Levin et al. [72] investigated mindfulness and problematic eating in 820 patients seeking bariatric surgery and found that greater mindfulness was related to less binge and emotional eating, as well as less habitual overeating and grazing. Acting with awareness, a facet of mindfulness, was consistently related to eating behavior.

One mindful eating group intervention study has so far been published with post-bariatric surgery patients. The group was conducted in a hospital setting for ten weekly sessions of 75 min each and incorporated CBT strategies such as regular eating, keeping an eating journal that

included associated thoughts and feelings, controlling portion sizes, and removing triggering foods from the home. Mindful eating practices were facilitated in each session to improve awareness of reactions to food and eating. The group was composed of seven patients who had either undergone gastric bypass or banding and who reported subjective binges with loss of control and eating to manage emotions. Post-intervention, patients reported improvements in eating, emotion regulation, and depression, changes that theoretically should help patients reduce problem eating and thus prevent weight regain. There was a modest reduction in the participants' overall weight [73].

17.8 Integrating Mindful Eating in Individual Psychotherapy

While the majority of research studies investigating mindful eating have been on group interventions, it is also possible to integrate mindful eating practices into individual therapy sessions. Indeed, Martin [74] proposed that mindfulness is the core of psychotherapy process.

A growing body of literature has examined the benefits [75–77]. In many MBIs, such as MBSR, MBCT and MB-EAT, “The Raisin Exercise” [2] is commonly used to introduce participants to the practice of mindfulness and to engage fully with all of their five senses. Other mindful eating exercises can be incorporated into individual therapy sessions such as rating hunger levels, fullness and taste satiety [21, 48, 78–80]. Please see Script 1 for a mindful eating script that may be used with individuals or groups.

As with the delivery of all MBIs, it is imperative that mindful eating interventions be facilitated by clinicians trained in the principles of mindfulness, specifically mindful eating, and that clinicians develop and maintain a formal and informal mindfulness practice of their own [81]. More importantly, mindfulness can cultivate clinically beneficial qualities in psychotherapists, such as self-attunement, affect tolerance, empathy, openness, acceptance, and compassion [82, 83].

The role of the psychotherapist's mindfulness practice, therefore, would optimize the therapeutic relationship/alliance and produce better outcomes (e.g., symptom reduction) for the client.

17.9 Application of Mindfulness-Based Techniques

Betty attended all ten sessions of MB-EAT and participated well by sharing her mindful eating experiences, insights, and challenges to the bigger group. She completed her homework daily, which included formal (e.g., Body Scan, Sitting) and informal (e.g., Mindful Walking, Eating) mindfulness meditations exercises which lasted between 15 and 30 min and other pleasurable activities that did not involve food.

Betty's binge eating and overall intake of food decreased gradually over the course of the program. Her self-reported frequency of binge eating episodes decreased from eight per month to two per month at 4 months posttreatment. Grazing and emotional eating also declined from 5 times per week to a maximum of 2 per week. She lost 5 kg (to 75.91 kg) within 3 months following posttreatment, bringing her BMI to 29.6 and her diabetes improved.

At 4 months posttreatment, Betty indicated that since participating in MB-EAT she has noticed positive changes in the way she appreciates food. She reported taking the time prior to eating a snack or meal to briefly meditate and attend to her hunger signals. This has helped her to decrease her portion sizes and to savor her meals by slowing down/chewing thoroughly while eating. Betty stated that instead of purchasing foods impulsively at the supermarket, she has developed more awareness and outer wisdom in making healthier nutritional choices. She has also become less critical of herself when she does overeat and takes the time to gently observe her experiences rather than catastrophizing. Her family commented on her ability to be more assertive, calmer, and less reactive in stressful situations. Betty stated, "I used to cry uncontrollably when I was stressed but now I totally bypass the crying fit and just breathe!"

Betty attributed her changes to eating by "being present in the moment," taking the time to pause before eating, paying attention to her hunger signals and practicing mindfulness meditation daily. She further found the group pot-luck to be especially helpful in allowing her to select foods without judgment and "savoring the flavors." She was able to use these new skills when attending dinner gatherings with her friends and family.

17.10 Summary

- The rationale for mindful eating interventions comes from evidence that obesity resulting from problem eating can be caused by emotional eating, lack of interoceptive awareness and externally cued eating. The body's biological stress response may also contribute to obesity and may be modified through mindfulness practice.
- Outcome research on mindful eating is limited but promising. Mindful eating interventions appear effective at treating problem eating associated with weight gain. To facilitate weight loss, information on nutrition and strategies for regulating eating should be incorporated.
- Patients should be educated that while weight loss may result from mindful eating, this is not the only goal of the practice. Rather, it is a means by which to develop a new relationship with food and themselves.
- Mindful eating interventions should be delivered by clinicians trained in the principles of mindfulness, specifically mindful eating. It is also imperative that clinicians develop a formal and informal mindfulness practice of their own.

Appendix

Script 1: Mindful Eating Meditation

This meditation is designed to help you cultivate mindful eating by engaging in all of your five senses while eating. This practice is also a helpful

way for you to develop a healthy and pleasurable relationship with food.

Prior to eating a meal or snack, please take a few moments to settle into a relaxed sitting position, with your food placed in front of you, either on a table or on your lap (10 s).

Allow your back to adopt an erect and comfortable posture (5 s). If you are sitting on a chair, place your feet flat on the floor, with your legs uncrossed (5 s). If you feel comfortable, gently close your eyes fully or partially (5 s).

Take three deep breaths to settle into your body and into this present moment (5 s).

YOU CAN BEGIN BY NOTICING the way your breath is moving in the body (10 s). Breathe from your diaphragm, or lower stomach, rather than the chest (10 s). If you like, you can put your hand on your stomach and feel the way it moves with the breath (10 s). You may notice that as you breathe in the stomach rises...and as you breathe out it falls (5 s). Spend a few more moments exploring these breathing sensations (5 s).

On your next in-breath, focus your attention on your stomach and assess your baseline hunger. Ask yourself: On a scale of 0–10, with 0 being “not hungry at all” and 10 being “extremely hungry,” *how hungry am I? And how do I know?*

SIGHT: When you are ready, open your eyes and imagine that you are seeing these food(s) for the first time, being open and curious to whatever arises (10 s). As you breathe in and out, notice the colors, shapes, and textures of the food in front of you (10 s).

TOUCH: Breathing in, focus your attention now to your sense of touch. Using utensils or your hands, pick up the food and either feel the texture against your lips or between your fingertips (5 s). Continue to pay attention to your sensation of touch for the next few moments (10 s).

SMELLS: On your next in-breath, shift your concentration to noticing the smells of the particular food(s) (10 s). Bring the food(s) to your nose and inhale deeply. Continue to breathe and focus on the slightest of scents...allowing them to come to you. As best as you can, be aware of any feel-

ings, sensations, or thoughts that are arising and let them be just as they are, without trying to change it (10 s).

TASTE: When you are ready, shift your attention from awareness of smells to awareness of taste (10 s). Place the food(s) in your mouth and begin to chew, observing any flavors that arise. Allow yourself to experience and savor the taste. As best as you can, pay attention to how the texture of the food(s) change as you are chewing and breaks down with every bite.

SOUNDS: While you are chewing, notice the sound(s) that the food(s) is making. Be open and receptive to those sounds that may arise while you are eating, without naming or labeling them. Whenever you become aware that the mind has wandered, gently acknowledge where the mind has gone to and as best as you can, return to your practice of eating mindfully. Continue to chew your food(s). When you are ready to swallow, feel the sensation as the food(s) slides down your throat. If you like, you can imagine the food in your stomach.

Now rate your hunger levels on a scale from 0 to 10. Do you notice any changes?

You can continue to eat in this way for another few bites or if you like, until you finish your snack/meal. Remember that you can always return to this mindful eating practice anytime you wish.

Checklist 1: Remember “MANGER” (French = To Eat)

1. **M**indful check in with one’s body, emotions, thoughts, and hunger levels (Scale, 1–10, with 1 being “not hungry” at all and 10 being “starving”).
2. **A**ccess, observe, and savor food with five senses: sight, smell, sound, taste, and touch.
3. **N**ourish your body with “just enough” food.
4. **G**ently investigate your hunger throughout eating.
5. **E**at slowly and chew thoroughly.
6. **R**ecognize and listen to your inner and outer wisdom.

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