

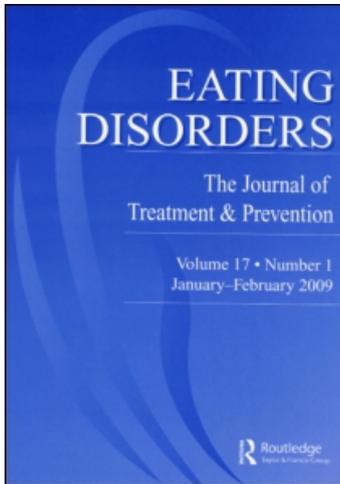
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Publisher Routledge

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Eating Disorders

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713666342>

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Online publication date: 20 December 2010

To cite this Article Kristeller, Jean L. and Wolever, Ruth Q.(2011) 'Mindfulness-Based Eating Awareness Training for Treating Binge Eating Disorder: The Conceptual Foundation', *Eating Disorders*, 19: 1, 49 – 61

To link to this Article: DOI: 10.1080/10640266.2011.533605

URL: <http://dx.doi.org/10.1080/10640266.2011.533605>

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Mindfulness-Based Eating Awareness Training for Treating Binge Eating Disorder: The Conceptual Foundation

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This paper reviews the conceptual foundation of mindfulness-based eating awareness training (MB-EAT). It provides an overview of key therapeutic components as well as a brief review of current research. MB-EAT is a group intervention that was developed for treatment of binge eating disorder (BED) and related issues. BED is marked by emotional, behavioral and physiological dysregulation in relation to food intake and self-identity. MB-EAT involves training in mindfulness meditation and guided mindfulness practices that are designed to address the core issues of BED: controlling responses to varying emotional states; making conscious food choices; developing an awareness of hunger and satiety cues; and cultivating self-acceptance. Evidence to date supports the value of MB-EAT in decreasing binge episodes, improving one's sense of self-control with regard to eating, and diminishing depressive symptoms.

INTRODUCTION

Mindfulness-based eating awareness training (MB-EAT; Kristeller, Baer, & Quillian-Wolever, 2006; Kristeller & Hallett, 1999; Wolever & Best, 2009) was developed specifically for treatment of binge eating disorder (BED)

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and related issues. BED is marked by use of food to handle emotional distress (Goldfield, Adamo, Rutherford, & Legg, 2008), along with dysregulation of interoceptive awareness, appetite and satiety mechanisms (Sysko, Devlin, Walsh, Zimmerli, & Kissileff, 2007), and reactivity to food cues (Sobik, Hutchison, & Craighead, 2005). Even if familiar with nutritional recommendations for healthy eating, individuals with BED generally report frustration and a sense of inadequacy using such guidelines. Eating, food, and body weight typically play a disproportionate role as aspects of self-identity (Dunkley & Grilo, 2007). Rather than being a nurturing process, the relationship to eating and food is experienced as an internal struggle marked by intense approach and avoidance.

MB-EAT was originally informed by three theoretical approaches: models of food intake regulation that emphasize the interplay of psychological and physiological control processes (Hetherington & Rolls, 1996; Rodin, 1981), self-regulation theory (Schwartz, 1975), and neuro-cognitive and therapeutic models of mindfulness meditation (Goleman, 1988; Kristeller, 2007; Siegel, 2007). Decades of research on physiological hunger and satiety mechanisms indicate that such signals are easily overridden by non-nutritive influences (Capaldi, 1996). In particular, individuals with BED show marked imbalance and oversensitivity to “external” or “non-nutritive” cues to eat (social, emotional, or conditioned craving for certain foods), and a concomitant desensitization to “internal” cues, particularly related to normal satiety processes. While one model of this imbalance is grounded in biological (e.g., genetic or epigenetic) explanations of hedonic imbalance (Appelhans, 2009), an alternative perspective is that individuals become “disconnected” from internal experience, creating patterns of “mindless” eating (Wansink, 2007). Many binge eaters seek out traditional diet programs; these may be effective in the short term, but may further disconnect individuals from internal signals by imposing external structure with little personal flexibility or opportunity to re-learn adaptive habits, and often fail to acknowledge or address the intensity of hedonic craving.

Self-regulation theory (Schwartz, 1975; Shapiro & Schwartz, 2000) posits that internal regulatory processes in the body depend to a substantial degree on a capacity to self-observe internal states. As is the case for biofeedback, an original focus of self-regulation theory, cultivation of self-awareness of relevant internal cues can engage regulatory systems more effectively. Drawing on homeostatic models of psychobiological functioning, self-regulation theory further proposes that even complex systems can be re-regulated and maintained with relatively little sense of effort or struggle. This perspective is somewhat in contrast to self-control models that presume an ongoing need for vigilance, externally imposed structure, and effortful self-management. A primary goal of the MB-EAT program is to re-regulate the balance between physiological factors and non-nutritive factors that drive eating. Thus, by helping individuals cultivate greater

awareness of hunger and satiety as well as emotional states and external triggers, MB-EAT engages self-regulatory processes related to appetite, emotional balance, and behavior.

Emerging neurocognitive models support the value of meditation practice as a path toward change (Lutz, Slagter, Dunne, & Davidson, 2008). This is particularly true for complex systems in which self-protective or appetitive drives (such as anxiety reactions or addictive processes) need to be brought into better balance through higher level neuro-processing. While meditation is recognized to have powerful impact as a “relaxation” tool, it is more appropriately viewed as a way to cultivate a particular quality of attention and awareness, which then mediates self-regulation across multiple domains of functioning, including physical, emotional, behavioral, and relationship to self and others. This multi-domain model of meditation (Kristeller, 2003, 2007) is particularly applicable to treatment of complex eating disorders since they involve dysregulation in multiple domains of functioning.

The concepts of emergent “wisdom” and self-acceptance, core aspects of traditional meditation practice, also are central to the MB-EAT program. Participants are encouraged to recognize their own internal strengths, and be open to their own understanding and solutions to challenging situations, rather than reacting judgmentally to self-perceived variances from internalized norms, whether of behavior or weight, a hallmark of eating disorders. Within our framework, mindfulness meditation is conceptualized as a way of training attention to increase nonjudgmental awareness of internal experience and automatic patterns related to eating, emotional regulation, and self-acceptance. The importance of self-acceptance, compassion and forgiveness are highly relevant to interrupting the dysfunctional cycles of bingeing, self-recrimination, and over-restraint. Mindfulness meditation is further used to cultivate the capacity to disengage undesirable reactivity, and to engage processes that can more “wisely” inform behavior (Kristeller, 2003; Kristeller, et al., 2006; Wolever & Best, 2009). Other therapeutic applications of mindfulness meditation, such as the Mindfulness-Based Stress Reduction Program (Kabat-Zinn, 1990), Mindfulness-Based Cognitive Therapy (Segal, Williams, & Teasdale, 2002), and Mindfulness-Based Relapse Prevention (Marlatt, Bowen, & Lustyk, in press) undertake similar goals in regard to treatment of anxiety disorders, depression, and addictions, respectively. They also utilize both general training in mindfulness meditation and mindfulness exercises specific to the presenting issues and associated therapeutic needs.

The MB-EAT model is consistent with other perspectives on treating dysfunctional and highly conditioned eating patterns, including the following: the chronic dieting model (Herman & Polivy, 1980), the escape model (Heatherton & Baumeister, 1991), cognitive-behavioral approaches (Apple & Agras, 1997; Fairburn & Wilson, 1993), interpersonal therapy (Wilfley et al., 2002) for BED, and other approaches incorporating mindfulness within acceptance-based treatments (Safer, Telch, & Chen, 2009; Wilson,

2004). However, similar to Appetite Awareness Training (Allen & Craighead, 1999), MB-EAT brings more explicit attention to processes of food intake *per se*. MB-EAT also incorporates more recent work recognizing the complexity of hedonic drives associated with food (Appelhans, 2009); retraining hunger and satiety awareness may be particularly pertinent to managing such hedonic pressure in individuals particularly sensitive to this aspect of eating. In sum, the MB-EAT program is designed to help individuals cultivate awareness of both internal and external triggers to eating, interrupt dysfunctional cycles of binging, self-recrimination and over-restraint, and re-engage the natural physiological processes of eating regulation. Furthermore, the program emphasizes the pleasure and nurturing aspects of eating, while encouraging healthier patterns of food choice, in terms of both types and amount of food eaten. MB-EAT is further designed to do so in a way that is effective in internalizing and maintaining change.

PROGRAM STRUCTURE: THE CONCEPTUAL FRAMEWORK

The MB-EAT program is structured to gradually introduce, in parallel, elements of mindfulness meditation practice, mindful eating, and themes of self-awareness and self-acceptance. Table 1 outlines key theoretical principles and concepts, treatment components reflecting each principle, and related core practices used in the 10-session treatment program.

Cultivating Mindfulness

MB-EAT emphasizes the value of mindfulness meditation for cultivating an ability to focus attention, engage awareness, and disengage “mindless” reactivity. In addition, the program stresses the core concepts of engaging “wisdom” and the heartfelt qualities of mindfulness such as non-judgment, compassion, and self-acceptance. Training in mindfulness practice begins with breath awareness and sitting meditation. In Session 2, we introduce the practice of using “mini-meditations” to quiet and focus attention in the moment as a way to bring mindfulness to eating experiences. This process is later generalized to bringing mindfulness to any aspect of daily life. All sessions include mindfulness practice; participants are encouraged to practice daily at home, initially for 10 minutes, and then for 20 minutes.

Cultivating Mindful Eating

In the first seven sessions, different mindfulness exercises are used to help individuals bring awareness to and re-balance aspects of eating that are typically dysregulated in eating disorders. Each experience is introduced through a guided meditation practice, followed by discussion. Exercises target the

TABLE 1 Components of MB-EAT: Principles and Related Exercises

Concept/principle	Component	Session	Exercise
1. Cultivating Mindfulness			
a. Cultivate capacity to direct attention, be aware, disengage reactivity, and be non-judgmental.	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 (Ses. 10).
2. Cultivating Mindful Eating			
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 & crackers; chocolate; fruit & 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.” Pot luck/buffet homework.
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. Pot luck/buffet homework.

(Continued)

TABLE 1 (*Continued*)

Concept/principle	Component	Session	Exercise
g. Awareness of negative self-judgment regarding eating. Cultivate non-judgmental awareness of eating experience.	g. Eating challenging foods. Identifying cognitive distortions.	2-6, 9, 10	g. Identifying "black & white" thinking; "surfing the urge"; abstinence violation effect.
3. Cultivating Emotional Balance			
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.
4. Cultivating Self-acceptance			
a. Acceptance and non-selfjudgment of body/self-regulation/gentle exercise.	a. Relationship to the body.	1, 3-5, 8	a. Breathe 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, 10	c. Wisdom meditation. Discussion throughout.

following: bringing awareness to sensations of physical hunger and different types of satiety (stomach fullness and sensory-specific satiety); bringing mindfulness to eating all types/categories of food with a focus on gaining hedonic pleasure from small quantities of food; awareness of non-nutritive triggers for eating and making particular food choices. The first guided experience is borrowed from MBSR: mindfully eating three raisins. Emphasis is placed on noticing and amplifying each sensation, noting thoughts and feelings while eating the raisin, observing flavor and texture preferences, and savoring each raisin as fully as possible. Participants generally share amazement at the intensity of the experience, the distinctness of each raisin, and awareness of how the experience differs from “mindlessly” eating a handful of raisins all at once.

Six sessions have an embedded mindful eating practice. After the first mindful eating experience with raisins, the foods are increasingly challenging in terms of hedonic and caloric value. Common snack foods with lower nutritional value are used to bring mindful awareness to potential “binge” foods. This also engages the “liking” vs. “wanting” distinction, of increasing interest in the experimental food regulation literature (Finlayson, King, & Blundell, 2007). In Session 2, participants eat cheese and crackers mindfully, and in Session 4, chocolate brownies. In Session 5, they mindfully choose to eat two of three possible snack foods: corn chips, a butter cookie, or grapes. This exercise increases awareness of how they make food choices, encourages consideration of healthier vs. less healthy food choices, and cultivates awareness of “taste satisfaction,” our term for “sensory specific satiety.” Once individuals become more attuned to the sensory experience, they often express surprise at how their chosen “snack” is less appealing (saltier or greasier or less flavorful) than anticipated, with pleasure quickly peaking and then fading rapidly. Session 7 includes a pot-luck meal, to which participants bring two dishes: one that reflects a “healthier” style of eating; and one that is a favorite food difficult to eat in moderation (e.g., macaroni and cheese). The meal is begun in silence and offers guidelines around mindfully returning for “seconds,” encouragement to leave food on the plate, and reminders to choose “quality over quantity.”

Session 3 introduces the exploration of the experience of physical hunger, as distinct from emotional hunger. Participants are asked to note how physically hungry they are on a 10-point scale, with 10 being *as hungry as possible*, and 1 being *not hungry at all*. They are then asked to clarify the physical signals used to determine hunger ratings. In session 4, awareness of fullness is introduced by having participants drink a large bottle of water, also using a 10-point scale, to rate fullness. Using a second scale makes clear that hunger and fullness are not just opposite ends of a scale but overlap, because they are controlled by distinct, although related, mechanisms. Use of water also emphasizes that stomach distention is somewhat separate from caloric intake, underscoring the complexity of these processes.

Homework related to mindful eating begins with the challenge to eat one meal or snack mindfully each day, increasing to eating all meals and snacks mindfully. Initial assignments focus on single aspects of mindful eating (e.g., flavor, pace, attention to hunger) to build specific skills. Later assignments encourage integration of multiple skills by simultaneously attending to physical hunger, food choice, flavor, texture, fullness, thoughts, and feelings before and throughout eating. For example, after the pot luck meal, the homework includes going to an “all you can eat” buffet. The assignment entails use of all of the eating practices to date under inherently difficult circumstances, an important learning experience, given the frequent challenges of family meals or parties.

Cultivating Emotional Balance

There is no question that eating meets emotional needs, more for some individuals than others. Mindfulness practice is used to help cultivate awareness of emotional triggers and eating patterns, as a way to interrupt the chain of reactivity, and a way to contribute to emotional well-being. A chain reaction exercise, adapted from Dialectical Behavior Therapy for eating disorders (Wisniewski & Kelly, 2003), helps capture the complexity of over-conditioned responses, accompanied by the message that the links in the chain can be uncoupled at many points, even in the midst of a binge. The link between harsh self-judgment, over-eating, and negative affect is addressed, along with common types of distorted thinking that usually serve to further the cycle of disordered eating and negative mood. One common thought distortion is the abstinence violation effect (“I’ve blown it, so I might as well keep going;” Marlatt & Gordon, 1985). Work with such cognitive distortions is expanded from eating behavior to a wider range of experience. Participants are also encouraged to explore alternatives to eating as ways to meet their emotional needs; at the same time, they are encouraged to savor their own preferred “comfort” foods in smaller quantities, with a focus on quality.

Cultivating Self-Acceptance

Another theme of the program is developing a better relationship with the self, including the physical self, self-identity, and self in relation to others. A body scan exercise encourages distinguishing between experiencing the body and judging the body. This is followed by gentle chair yoga in Session 5, and mindful walking in Session 8, which serve to further increase awareness of the body while simultaneously cultivating an attitude of kindness and compassion. Chair yoga is used instead of floor yoga because individuals whose BMI is over 40 (the average weight of our treatment participants) may have significant difficulty getting down to the floor. Furthermore, chair yoga encourages use of gentle yoga stretches within usual daily routines

(such as at a desk or table). Mindful walking, at varying speeds, helps bring a quality of awareness into daily activity as well as to the process of moving the body, to appreciation for what the body can do, and to recognition of its needs. Finally, a healing self-touch exercise¹ often has profound impact, as participants are directed to fill their hands with loving kindness, and place them onto various parts of their bodies. They begin with areas they like and appreciate, and move on to extend appreciation to areas with which they struggle.

The theme of self-acceptance is extended beyond the body to shifting one's relationship to other aspects of the self. Participants are consistently encouraged to engage an attitude of curiosity and non-judgmental exploration of thoughts, feelings, and bodily states. Self-care is reinforced throughout, including active enjoyment and taking pleasure in eating. The delicate balance between accountability and self-blame is explored in a guided Forgiveness Meditation in Session 5. The meditation explores release of anger both at oneself and at others while also encouraging learning from these observations. It is not unusual that individuals recognize how such anger is driving their patterns of bingeing and self-recrimination. Self-acceptance and confidence regarding interpersonal interactions are explored throughout the program in the context of negotiating social pressures to eat from friends or family members. Self-acceptance is buoyed throughout the entire program as individuals are encouraged to recognize their own "inner wisdom" and cultivate it through meditation. This "inner wisdom" framework is referred to from the first session through the end, culminating as the primary theme of Session 10 with a guided Wisdom Meditation. The emphasis is on recognizing one's own inner wisdom and using it to create a path to wise choice, informed by general knowledge, but guided by experience and internal resources.

EMPIRICAL SUPPORT FOR MB-EAT

The original proof of concept study used a non-randomized, extended baseline/follow-up design (Kristeller & Hallett, 1999), with a completed sample of 18 obese women (out of 20 enrolled) who met criteria for BED (avg. age = 46.5; mean weight = 238 lbs.; mean BMI: 40). They participated in a 7-session group program over 6 weeks. Binges per week dropped from over 4 to about 1.5. By self-report, amount of food consumed during remaining binges decreased substantially, although four participants still met criteria for BED at 1 month follow-up. Scores on the Binge Eating Scale (BES; Gormally, Black, Daston, & Rardin, 1982) fell from the "severe" range to just higher

¹ The healing self-touch exercise was developed by Sasha Loring, MS, MEd at Duke Integrative Medicine.

than having “little or no problem” with binge eating. Depression decreased from clinical to sub-clinical levels. The strongest predictor of improvement in eating control was time spent using eating related meditations.

Subsequently, an NIH-funded two-site randomized clinical trial (Kristeller, Wolever & Sheets, under review) randomized participants with similar characteristics (total $N = 140$; 15% men) to three arms: MB-EAT; a psycho-educational (PE) treatment based on the Duke Diet and Fitness Center obesity treatment program; or a waiting list, with follow-up at 1 and 4 months. The treatment expanded to 9 sessions and included greater emphasis on body experience and the heartfelt qualities of mindfulness: non-judgment, compassion, and cultivation of self-acceptance. As has been reported in other studies comparing new interventions to other active interventions, the MB-EAT and PE groups showed somewhat similar improvements in behavior and on the BES. However, improvement in the MB-EAT group was greater or approached significance on measures indicative of internalizing change (e.g., the Hunger scale of the Three Factor Eating Questionnaire; Stunkard & Messick, 1985). Depression also improved in both groups but appeared to be for different reasons. The improvement in the PE group was linked to decreased bingeing, while the improvement in MB-EAT was linked to amount of meditation practice. Amount of meditation practice also predicted improvement on other indicators of self-regulation, including lost weight. Use of eating-related meditations and “mini-meditations” accounted for more of the variance than did general sitting meditation.

A recently completed trial (Kristeller, 2010) broadened recruitment to include those with a BMI of at least 35; 25% met criteria for clinical or sub-clinical (one binge/week) BED. The treatment expanded to 10 sessions (as outlined in Table 1), with two follow-up sessions, and includes additional components addressing “outer wisdom” specific to caloric and nutritional guidelines. These components explore how to use such guidelines in a personally sustainable way to encourage individuals to move toward weight loss, in addition to rebalancing eating patterns. The “inner wisdom” themes of hunger, satiety, and choice awareness remain the same, with exercises to encourage re-regulation of eating behaviors without a sense of struggle or self-recrimination. Preliminary analyses indicate that participants with BED showed comparable improvement to those without BED, including a weight loss of about 7 lbs. at immediate post, with equivalent retention in the study. Improvement on other key variables appears comparable to that observed in our previous research.

CONCLUSION

The MB-EAT program combines well understood principles of food intake regulation and principles of mindfulness meditation to provide a novel

approach to re-regulating eating behavior. While conceptually compatible with other effective approaches to treating eating disorders, it is unique in several respects. First, training in mindfulness meditation serves as a foundation for cultivating a capacity to bring non-judgmental awareness to the complex processes involved in food choice, the decision to initiate eating, and the decision to stop eating. Second, the training helps people systematically re-engage innate abilities to use hunger and satiety signals. Third, the training purposefully cultivates drawing pleasure from eating, by emphasizing “quality over quantity” in doing so. Finally, MB-EAT encourages an attitude of non-judgmental acceptance of self to daily living, body awareness and emotional experiences, beginning with food-related experiences and expanding to the whole self.

Research has demonstrated the effectiveness of MB-EAT in treating compulsive eating patterns associated with binge eating disorder. Ongoing research further suggests that MB-EAT can be adapted to address weight loss, without losing its effectiveness for treating the associated symptoms of binge eating. Further work is needed to explore its application to normalizing relationship to food and eating for both the compulsive and restrictive aspects of food intake associated with bulimia nervosa and anorexia nervosa.

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