

Obesity: Third Wave Case Conceptualization



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The obesity epidemic presents an unprecedented challenge to public health. Over two billion adults are currently overweight, and prevalence rates are at epidemic levels in most industrialized countries including Chile (74%), Mexico (73%), the United States (70%), Portugal (68%), Australia (67%), the United Kingdom (64%), Hungary (62%), Germany (60%), Canada (59%), Spain (53%) and France (49%) (OECD, 2019). Excess weight is a leading cause of death and it contributes to a wide range of health issues, including cardiovascular disease, type 2 diabetes, risk of certain cancers and early mortality (Al-Goblan et al., 2014; Di Angelantonio et al., 2016; Katzmarzyk et al., 2001; Lavie et al., 2009; Ortega et al., 2016; Renehan et al., 2008; Vucenik & Stains, 2012).

Lifestyle modification interventions are considered the current gold-standard treatment for obesity. Such programs prescribe calorie and physical activity goals and teach various behavioral skills, such as stimulus control, self-monitoring, problem-solving, and relapse prevention, in the service of adhering to these goals and obtaining negative energy balance. These programs produce significant weight loss (between 5% and 10%) over year-long intervention periods if delivered intensively (i.e. 16–30 sessions over 1–2 year) (Butryn et al., 2011; Wadden et al., 2020). Importantly, weight losses $\geq 5\%$ are considered clinically significant given their association with health benefits and reduction of chronic disease symptoms (Blackburn, 1995; Pasanisi et al., 2001).

However, the outcomes of traditional lifestyle modification interventions are suboptimal—a significant proportion of participants (approximately one third) do not lose clinically significant amounts of weight, and rates of weight regain in the absence of weight maintenance therapy are high, with nearly one-half of participants returning to their original weight within 5-years (Butryn et al., 2011). Thus,

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despite the short-term efficacy of lifestyle modification programs for weight loss, long-term weight maintenance remains poor and of critical importance to address.

Partly in response to the suboptimal outcomes of current gold-standard lifestyle modification approaches, new treatments for weight loss that incorporate mindfulness and/or acceptance-based principles have been developed over the past 10–15 years. Third Wave treatments for obesity emphasize metacognitive awareness of thoughts, feelings, and decision-making and incorporate mindfulness- and/or acceptance-based strategies. Broadly speaking, these treatments can be categorized into two types: those that focus primarily on cultivating mindfulness through meditation and mindfulness practices (mindfulness-based interventions; MBIs), and those that synthesize cognitive, behavioral, and Third Wave treatment components (e.g., acceptance-based behavioral treatments; ABTs). While these two treatment approaches have some overlap, we will discuss each approach separately given their distinct theoretical underpinnings and treatment approaches.

Theoretical Rationale

Mindfulness-Based Interventions (MBIs)

There has been growing interest in the application of mindfulness techniques to issues of eating and weight, and a variety of treatment approaches now incorporate mindfulness in some capacity. Mindfulness is often defined as “the awareness that arises from paying attention, on purpose, in the present moment and non-judgmentally” (Kabat-Zinn, 2003a, b). Mindfulness is considered to be a trait (Baer et al., 2006), but can also be cultivated through the practice of mindfulness meditation. Though mindfulness principles have philosophical, spiritual, and contemplative origins, mindfulness practices and techniques have been incorporated into a variety of psychological treatments, and have been found to produce clinical benefits for a range of conditions, including anxiety, depression, borderline personality disorder, somatization disorders and chronic pain (Baer, 2003; Hofmann et al., 2010; Lakhan & Schofield, 2013; Zeidan et al., 2011). More recently, mindfulness has been used to target problematic eating behaviors (e.g., Alberts et al., 2010; Daubenmier et al., 2011; Kearney et al., 2012; Kristeller et al., 2014; Tapper et al., 2009; Timmerman & Brown, 2012).

Various theoretical models suggest that obesity and overweight are related to dysregulation of eating behaviours as well as maladaptive responses to internal and external cues. The dysregulation model of obesity, for example, posits that the inability to self-regulate eating behaviors results from poor recognition of physical hunger and satiety cues (Dalen et al., 2010). Recently, mindfulness has gained attention as an avenue through which problematic eating could be targeted by improving awareness of internal and external cues (Dalen et al., 2010; Kristeller & Wolever, 2011). Additionally, mindfulness cultivates the skill of self-regulation by

encouraging non-judgmental awareness (Baer, 2003; Shapiro et al., 2006), which may also be beneficial in discouraging overeating.

Eating in response to cues other than hunger is a key factor proposed to disrupt weight maintenance efforts. For example, a significant proportion of adults with overweight or obesity (an estimated 57–90%) vs. approximately 15–45% of non-overweight individuals report eating in response to their emotions (Ganley, 1989; Gibson, 2012; Péneau et al., 2013), and greater emotional eating predicts poorer weight loss outcomes (Fraysn & Knäuper, 2018). Similarly, stress is associated with hedonic hunger (Lemmens et al., 2011) and preference for high fat, high calorie foods (Oliver et al., 2000), which if experienced chronically, may contribute to obesity (Dallman et al., 2003). Mindfulness training cultivates the ability to attend to one's emotional experiences and accept them (rather than attempt to suppress them by eating) by enhancing awareness of cravings, physical sensations, emotions, and thoughts in a non-judgmental and curious way (Kristeller & Wolever, 2011). Mindfulness may then attenuate the relationship between emotions/stress and the non-hunger-related eating that is proposed to disrupt weight regulation.

Individuals also frequently eat in response to various *external* cues, such as the presence of highly palatable foods or locations/events associated with eating (e.g. a movie theatre). Mindfulness can counteract eating due to external factors by increasing awareness of the factors that may cue eating, and by promoting nonreactive responses to immediate desire and impulses. For example, MBIs teach people to “tune in” to their internal experiences, including hunger and fullness signals, and to mindfully observe moment-by-moment sensations while eating (Kristeller & Wolever, 2011). Individuals can then utilize an awareness of these signals to guide eating, rather than eat from a place of habit, automaticity, or reactivity. The cultivation of internal awareness (sometimes called “inner wisdom”) may be particularly key given the ubiquity of highly palatable foods and the prevalence of reward-driven eating. Reward-driven eating, characterized by loss of control over eating, a lack of fullness or satisfaction when eating, and a preoccupation with food (Epel et al., 2014), can overwhelm natural homeostatic mechanisms that govern hunger and satiety (Berthoud, 2006), resulting in weight loss difficulties (Mason et al., 2016).

Through increasing awareness of thoughts, feelings, sensations, and external cues, mindfulness enhances self-awareness. Self-awareness can in turn allow individuals to notice maladaptive eating behaviors and their triggers (Brewer et al., 2018), and to notice the consequences of maladaptive eating behaviors, such as the emotional and physical effects of eating past satiety or in the absence of hunger. This same awareness also allows individuals to notice and appreciate the physical and emotional consequences of more adaptive eating behaviors, such as eating in response to hunger and fullness cues (Brewer et al., 2018).

In addition to increasing moment-by-moment awareness, mindfulness is thought to strengthen higher level processes more generally, such as dispositional attentional control (de Bruin et al., 2016; Chambers et al., 2008; Rodriguez Vega, 2014), working memory (Zeidan et al., 2010), visuo-spatial processing (Zeidan et al., 2010), and executive function (Zeidan et al., 2010). Meditative practices enhance attentional control, for example, by instructing individuals to focus attention on the

breath or the body and continually bring attention back to the object of focus when the mind wanders. Attentional control can then be used to target weight-control related behaviours, such as through enhancing enjoyment of physical activity and healthy foods (e.g., by increasing taste satisfaction), and by reducing overconsumption of certain foods (Loucks et al., 2019). The continued attentional refocusing involved in mindfulness may train self-regulatory skills (Tang et al., 2007), which are thought to be critical to successful weight management (Wing et al., 2006).

Of note, mindfulness may constitute an “effortless awareness” form of self-regulation, which is different than self-regulation that comes from deliberate effort (e.g., using cognitive control to distract or resist experiences) (Friese et al., 2012; Garrison et al., 2013; Kabat-Zinn, 1982). Indeed, brain imaging work suggests that mindfulness-based treatments do not rely upon the recruitment of prefrontal brain regions associated with cognitive control, unlike cognitive-based treatments (Kober et al., 2017).

Mindfulness practices also promote acceptance, both of in-the-moment thoughts, feelings, and sensations, and of oneself and one’s body more generally. An attitude of acceptance could in turn reduce avoidant or inflexible patterns of behavior thought to maintain a variety of disorders, including binge eating (Lillis et al., 2011).

Given that mindfulness targets core processes implicated in issues of eating (such as automatic or reactive patterns of eating, dysregulation of affect and behavior, and self-judgment), it follows that mindfulness has been drawn upon in efforts to enhance the treatment of disordered and dysregulated eating. In this chapter, we define MBIs as skill-based interventions that focus upon (i.e. target in each session) cultivating greater mindfulness through either traditional meditation practice (Kabat-Zinn, 2003a, b), or through exercises aimed at increasing present moment awareness in daily life, such as through increased awareness of thoughts and feelings, or hunger and satiety cues (Craighead & Allen, 1995; Kristeller & Hallett, 1999). We contrast such approaches in which mindfulness is the primary treatment component to interventions that include mindfulness as one of many treatment components, such as ABTs, ACT, and Dialectical Behavioral Therapy for binge eating (Telch et al., 2001).

Acceptance-Based Behavioral Treatments (ABTs)

According to ABT, obesity is an expected consequence of living in an obesogenic environment—that is, an environment in which highly palatable, calorie dense foods are in over-abundance, and the need for physical activity in daily living is low. Instead, human beings evolved to prefer high calorie foods and to *conserve* energy—in our distant evolutionary history, it was to our advantage to consume high calorie foods when available, and to limit energy expenditure through staying sedentary when possible.

This mismatch between our modern-day obesogenic environment and our evolved preferences is thought to give rise a variety of internal experiences, such as

thoughts, emotions, and physiological experiences (e.g., urges), that pull people away from weight control goals, such as calorie reduction and physical activity promotion. The provision of strategies to manage these challenging internal experiences is considered a critical “puzzle piece” that is missing within current gold-standard weight loss approaches. For example, even if individuals modify their home environment so as to only include healthy, lower calorie food options, they may still experience cravings and preferences for higher-calorie foods passing by restaurants and fast-food chains on their way to work. As such, ABTs provide participants with additional psychological skills, based upon principles of mindfulness and/or acceptance, to manage challenging internal experiences that inevitably arise.

Behavioral weight loss strategies are conceptualized as a core foundation for weight control. Participants are thought to be successful in ABTs in so far as they adhere to the prescribed calorie and physical activity goals, which produce a negative energy balance, and thus weight loss. Key behavioral strategies such as self-monitoring dietary intake and weight, problem-solving, stimulus control (i.e. adjusting one’s immediate environment such that higher calorie foods are less readily available, and lower calorie foods are more readily available), and goal setting are considered essential to meeting calorie and physical activity goals. Yet, it is tremendously difficult to adhere to calorie and physical activity prescriptions in a modern-day obesogenic environment. Thus, traditional lifestyle modification interventions based upon these principles often produce suboptimal outcomes.

To counteract the biological, social and environmental challenges of sustained weight control, ABTs supplement behavioral strategies from traditional lifestyle modification interventions with acceptance- and mindfulness-based skills from Third Wave therapies, in particular Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), but also Dialectical Behavior Therapy (DBT; Linehan, 1993), and techniques, such as urge surfing, from Marlatt’s relapse prevention model (Marlatt & George, 1984).

Treatment Overviews

Mindfulness-Based Interventions (MBIs)

Mindfulness-based treatments were originally developed for non weight loss seeking populations (Kabat-Zinn, 1990; Teasdale et al., 2000), but have since been adapted and built upon to target issues of weight and eating. Given the conceptual fit of mindfulness skills and weight management, a growing number of studies of mindfulness-based treatments include weight as an outcome measure (Alberts et al., 2010; Kearney et al., 2012) and some mindfulness-based treatments have been adapted so as to target issues of eating and weight.

Mindfulness-Based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999; Kristeller & Wolever, 2011; Kristeller et al., 2014), for example, is a 12-week

manualized group-based intervention originally developed to normalize patterns of eating amongst samples with binge eating. MB-EAT incorporates some traditional mindfulness meditation (e.g. on breath or general awareness) with the goal of increasing attentional and self-regulatory abilities. In addition, MB-EAT incorporates content specific to mindful eating with the goal of disrupting automatic or habitual patterns of eating. The overarching aim of MB-EAT is to enhance self-regulation related to eating, emotions, and behavior. While MB-EAT was originally developed for binge eating, elements of MB-EAT have since been adapted and incorporated into treatments focused upon increasing healthy eating or promoting weight management or weight loss. Below, we describe the core elements of MB-EAT (see Kristeller & Wolever, 2011 for an overview of the conceptual foundation of MB-EAT), and then discuss how adaptations of MB-EAT have been applied to weight loss and related outcomes.

Training Mindfulness MB-EAT draws inspiration from traditional mindfulness-based treatments, such as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (MBCT; Teasdale et al., 2000). Such interventions systematically train mindfulness through mindfulness meditations that guide participants to at first focus attention on a target (e.g. the breath), and nonjudgmentally observe when attention has shifted before gently reorienting to the attentional target. Then, participants are invited to openly observe any thoughts, feelings or sensations that arise as transient mental states. MB-EAT incorporates various mindfulness meditations and exercises, such as body scans, sitting meditations and walking meditations (Baer, 2015), from such traditional mindfulness programs. In MB-EAT, certain adaptations to traditional mindfulness programs are made to make the program more accessible to individuals with overweight, such as teaching chair yoga instead of hatha yoga.

As in traditional mindfulness programs (e.g. MBSR), in MB-EAT participants are encouraged to maintain a regular meditation practice (10–20 min daily) outside of sessions. Participants are encouraged to practice mindfulness not only through formal meditations, but also in the midst of daily activities with “mini-meditations.” Mini-meditations involve taking a moment to pause and observe one’s internal sensations throughout the day, and especially before meals or in moments of stress.

Cultivating Mindful Eating Several exercises in MB-EAT involve developing the ability to tune in to biological hunger and satiety signals, which individuals with eating issues are often proposed to be disconnected from (Kristeller & Wolever, 2011). To aid in this ability, individuals are taught to distinguish between, and accurately label, internal experiences, such as physical/biological hunger and emotional/hedonic hunger. A variety of guided mindful eating meditations are conducted throughout the program. For example, the MB-EAT program introduces mindful eating with a raisin, and then incorporates foods that are increasingly difficult to mindfully eat (e.g., sweet high fat food) during the remainder of the program due to their hedonic or caloric properties. Following guided meditations that introduce and train these abilities, group discussions prompt individuals to reflect upon their

experiences. Near the end of the program, to simulate the challenges of mindfully eating at a buffet or party, participants are guided to mindfully eat a potluck-style meal consisting of a “healthier” dish and a favorite dish.

MB-EAT teaches participants not only to tune into hunger and satiety signals but also to notice and increase enjoyment of food, for example, through observing flavor and texture preferences, and through savoring each morsel of food. A distinction is made between “wanting and liking” (Finlayson et al., 2007) based upon “sensory-specific satiety” or *taste satiety*, the phenomenon by which taste buds adapt to the flavor of a food after eating a small quantity of it, and thus the subjective taste of a food decreases (Hetherington & Rolls, 1996). Participants are taught to derive pleasure from eating based upon the *quality* of the eating experience, as opposed to the *quantity* of the food ingested. Emphasis is placed on making food choices not only based upon calorie or nutritional considerations, but also based upon what foods one enjoys.

Disrupting Emotional Eating In MB-EAT, emotional eating is considered to be a common driver of overeating. Participants are thus taught to increase their awareness of emotions, thoughts, and self-judgments that often cue eating, and to interrupt patterns in which such cues prompt reactive eating. Cognitive distortions (e.g. permission-giving thoughts such as, “I already ate too much, I may as well keep eating now”) are addressed, and individuals are encouraged to find healthier ways of meeting their emotional needs.

Cultivating Self-Acceptance MB-EAT also focuses upon cultivating a stance of self-acceptance, given that many people with binge eating struggle with self-criticism and feelings of guilt or shame. A body scan exercise, for example, teaches individuals to distinguish between judging the body and experiencing it (Kristeller & Wolever, 2011). Individuals are taught self-acceptance skills in relation to not only their body, but also themselves more generally. A general stance of acceptance towards the self is cultivated through various exercises such as a self-acceptance meditation in which participants are guided to let go of self-blaming or self-critical thoughts while focusing on the breath, and through practicing non-judgmental awareness of thoughts, feelings and sensations.

Treatment Adaptations for Weight Loss and Related Behaviors Since MB-EAT was originally developed for populations with binge eating, its focus has historically been the normalization of patterns of eating, as opposed to weight loss. Iterations of MB-EAT have presented calorie and nutrition information in the context of physical hunger and calorie balance, as opposed to weight loss (Kristeller et al., 2014). Certain MB-EAT programs have framed external calorie and nutrition information as “outer wisdom,” in contrast to the inner wisdom of tuning into one’s internal experiences and mindfully eating. Individuals can utilize this outer wisdom, paired with inner wisdom, to flexibly inform their personal weight management efforts (Kristeller & Lieberstein, 2016).

Interventions based upon MB-EAT have since been implemented into treatments explicitly targeting healthy eating, weight loss or weight management. Timmerman and Brown (2012), for example, evaluated a 6-week group-based mindful restaurant eating program for participants who frequently eat out. The aim of the program was to help participants select lower fat, lower calorie options when eating at restaurants. The program provided a combination of nutrition psychoeducation, goal setting (a core standard lifestyle modification skill), and mindful eating meditations promoting awareness of hunger and satiation signals and cues of mindless eating. Weight and dietary intake were included as primary outcome measures.

The Mindful Eating and Living program (MEAL; Dalen et al., 2010), was developed specifically for people with obesity, based upon past mindful eating interventions. Dalen et al. (2010) conducted a pilot study of the 6-week group-based MEAL curriculum, which incorporated mindfulness meditation, mindful eating, and group discussion. Eating exercises included a variety of foods and contexts in which eating occurs (e.g. when hungry full, alone, or with others). Participants were provided with basic nutrition and calorie information, though were encouraged to utilize mindfulness as opposed to external information to guide eating decisions. As with MB-EAT, MEAL incorporated a gradual physical activity promotion component of around 5–10% each week. Similarly, Daubenmier et al. (2016) evaluated a weight loss MBI for adults with obesity in the Supporting Health by Integrating Nutrition and Exercise clinical trial (“SHINE”). The treatment incorporated mindful eating exercises, self-acceptance and loving kindness meditation, home meditations, and mini-meditations. In addition, the treatment involved a modest calorie reduction (500 calories) and gradual physical activity promotion. Participants were given general nutrition psychoeducation on the benefits of increasing intake of fruits, vegetables and proteins, and decreasing calorie-dense foods that lacked in nutritional value.

Certain MBIs have also been adapted to focus on stress eating specifically, given the known effect of stress on visceral adiposity, and the negative health effects of visceral adiposity. Daubenmier et al. (2011) evaluated a 9-class MBI based upon MBSR, MBCT, and MB-EAT that targeted stress eating (and thus cortisol awakening response and abdominal fat). Overall weight loss was not a goal of the treatment. As such, participants were provided with 2-h of psychoeducation on nutrition and exercise; guidelines for reducing caloric intake or increasing exercise were not emphasized. Similarly, Corsica et al. (2014) developed a 6-week MBI for stress eating based upon MBSR and cognitive and behavioral strategies for stress eating. In addition to MBSR content, the intervention incorporated a variety of cognitive and behavioral techniques, such as stress education, cognitive restructuring, exposure and response prevention, alternate activities, and relapse prevention. Overall weight loss was again not the goal of the program, and calorie and physical activity prescriptions were not provided.

More recently, Loucks et al. (2019) conducted a Stage 1 single-arm clinical trial of a Mindfulness-Based Blood Pressure Reduction program (MB-BP). MB-BP retained the MBSR curriculum, and also included education on hypertension risk factors and health effects, as well as specific mindfulness modules focused on

awareness of diet, physical activity, medication adherence, alcohol consumption, stress, and social support for behavior change.

Overall, there is significant heterogeneity in MBIs in terms of duration (e.g., 6–12 weeks), intensity (e.g., the amount of daily mindfulness meditation practice encouraged) and focus (e.g., the normalization of eating behaviors, stress eating and weight loss). Critically, MBIs for eating and weight also vary in the degree to which traditional nutrition and weight loss psychoeducation is incorporated and emphasized. For example, in a systematic review of MBIs for eating and weight loss, Katterman et al. (2014) found that six of ten studies that measured weight as an outcome provided psychoeducation around nutrition, exercise, or energy balance. While most MBIs do not include behavioral weight loss strategies, a couple of more recent studies have, such as through incorporating goal setting (Timmerman & Brown, 2012) or by encouraging calorie reduction (Daubenmier et al., 2016). Thus, while MBIs target dysregulated or maladaptive patterns of eating, few explicitly focus upon weight loss and fewer incorporate strategies from traditional weight loss approaches (e.g., specific calorie prescriptions, goal setting, and self-monitoring). Future research would benefit from examining whether weight loss and maintenance outcomes could be improved by combining mindfulness strategies with established behavioral strategies.

Acceptance-Based Behavioral Treatments (ABTs)

One of the most widely researched treatments for weight loss that incorporates both mindfulness- and acceptance-based strategies is acceptance-based behavioral weight loss (ABT) (Roche et al., 2019). ABT represents a synthesis of behavioral weight loss and mindfulness and acceptance-based components. In contrast to MBIs, which generally do not emphasize behavioral strategies from traditional lifestyle modification interventions, in ABTs, behavioral weight loss strategies (e.g. stimulus control, self-monitoring, goal setting, problem solving, and increasing social support) are conceptualized as a core foundation for treatment success.

Yet, behavioral strategies are considered, on their own, to be insufficient for the tremendous challenges of living in an obesogenic environment. As such, ABT supplements behavioral strategies from traditional behavioral lifestyle modification interventions with acceptance-based skills, and sometimes mindfulness-based skills, from Third Wave therapies, in particular Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), but also Dialectical Behavior Therapy (DBT; Linehan, 1993), and parts of Marlatt's relapse prevention model, such as urge surfing (Marlatt & George, 1984). As with standard lifestyle modification programs, treatments are typically conducted via 20–31 group sessions over a year long period, with groups meeting weekly at first, and then tapering in frequency over time. Broadly speaking, ABTs can be conceptualized as including three interrelated core components: mindful decision-making, willingness, and valued living.

Mindful Decision Making As in MBIs, *mindful decision making* in ABTs involves training individuals to increase awareness of the perceptual, cognitive, and affective experiences that influence eating and physical activity decision-making. Mindful decision making applies to a wide range of behaviors, including what foods to buy and eat, when to start and stop eating, when to start and stop physical activity, and decisions relevant to one's personal food or physical activity environment. The overarching goal of mindfulness in ABT is to help individuals move from "mindless" eating/physical activity decision-making to mindful and deliberate decision-making in line with specific weight control goals.

Whereas many MBIs focus upon improving the self-management and normalization of eating (e.g. Kristeller et al., 2014), ABTs employ mindfulness as a strategy to meet specific prescribed calorie and physical goals. In ABTs, mindfulness serves to create a space between cues and automatic reactions, thus allowing people to intentionally select behaviors that may be more in line with their health goals. In this way, mindfulness in ABTs is distinct from mindfulness in MBIs, in which participants learn to tune into their body and use those cues, at least in part, to guide what and how much to eat (e.g., MB-EAT; Kristeller & Wolever, 2011).

Willingness Another core component of ABT is *willingness*, or choosing to engage in weight-control behaviors, such as calorie reduction, calorie tracking, and physical activity regardless of what one's internal experiences are pulling one to do. Willingness involves having a stance of acceptance towards internal experiences that will inevitably arise during weight control efforts, tolerating those difficult experiences and then choosing to engage in weight-control behaviors (e.g., choosing a smaller portion) that are consistent with long-term goals and values (e.g., being a healthy and engaged community member) rather than short-term desires (e.g., going back for a second helping). Willingness incorporates various cognitive defusion techniques aimed at creating distance from internal experiences, such as thoughts and feelings, and viewing these internal experiences as separate from the self. Cognitive defusion can be defined as "looking *at* thoughts rather than *from* thoughts" (Harris, 2009). In cognitive defusion exercises, participants are taught to view their thoughts and feelings as simply that—thoughts and feelings that the mind continually and automatically provides—as opposed to absolute truths that one must act upon.

In order to introduce cognitive defusion, various ACT metaphors are utilized, such as "hands over face," or "yellow sunglasses," which illustrate how it is easier to observe the world and one's mind at work at a distance (e.g. when one's hand is not directly in front of one's face, or when one's tinted sunglasses are taken off) (Blackledge & Hayes, 2001; Harris, 2009). Participants are taught to create distance and objectivity from their thoughts by utilizing the phrase "I'm having the thought that..." For instance, the phrase "I will never keep this weight off" would become "I am having the thought that I will never keep this weight off" (Kohlenberg et al., 1993, p. 588).

In ABT, the core goal of willingness is to help participants separate (“uncouple”) internal experiences (e.g., thoughts, feelings, cravings, and urges) from behaviors. Uncoupling is introduced, for instance, with the “pick up the pen” exercise which guides participants to pick up a pen or pencil *while* telling themselves that they cannot do so. Various strategies are then taught to help participants implement uncoupling into daily life, such as replacing the phrase “only if” with “even if.” For instance, the phrase “I would go grocery shopping for healthy ingredients tonight only if I wasn’t so tired” would become “I will go grocery shopping for healthy ingredients tonight even if I am tired.”

In addition, the willingness component of treatment incorporates the relapse prevention technique of “urge surfing” in which participants are taught to view their urges or cravings as ocean waves (Marlatt & Gordon, 1985). Just like ocean waves which gradually grow, crest, then fall, participants are taught that while urges can feel strong, they are always temporary. In ABT, emphasis is placed on a willingness to experience urges and cravings without judging them or acting upon them. In other words, a person could have a strong craving for chips, and still choose to eat an apple. Participants are taught that delaying an urge for even a few minutes is a success, and that urge surfing will become easier with practice.

Together, these willingness strategies promote the stance of accepting any internal experiences that arise (even uncomfortable or unwanted ones) and engaging in behaviors consistent with weight-control goals or values *regardless* of which way those internal experiences are pulling. Earlier iterations of ABT emphasized tolerating aversive experiences, such as hunger, cravings and “negative” emotions (Forman et al., 2013; Lillis et al., 2015), while later iterations focused upon tolerating reductions in pleasure, such as choosing a neutral or mildly pleasant food option in lieu of a highly pleasurable one (Forman et al., 2016). Of note, this later ABT iteration has found larger effects, perhaps because tolerating reductions in pleasure is related to hedonically driven overeating, which may be a more prevailing than distress-driven overeating.

Valued Living Finally, the *valued living* component in ABT is premised on the idea that commitment to weight control is exceptionally difficult due to environmental, biological, and motivational challenges and thus will only be maintained in the long-term if weight control efforts are connected to an individual’s big-picture life values. Values can be defined as freely chosen qualities of a desired life to continually guide purposive action (Hayes et al., 2006). In ABT, values are conceptualized as a way to “supercharge” motivation—with an awareness of values, participants have autonomously generated, personally meaningful reasons to make the tremendous challenge of weight loss worthwhile.

Values work in ABT begins with a structured process for identifying and clarifying life values. Values are described as “what we want our life to be about” and are illustrated through metaphors, such as a compass. While people can continually use a compass to move in a desired direction, they can never “reach” East. In this way, values are distinct from goals, which are discrete and accomplishable (e.g., a 10% weight loss). To begin clarifying values, participants are prompted to consider

values in various life domains (e.g. work, family, spirituality). Then, they are guided to connect these values to weight control. Values that connect to weight control include taking care of one's body, being a good role model for one's community, being there for one's family in the long-term, engaging in meaningful hobbies and interests to the fullest extent possible, and being a lifelong learner. In later sessions, participants are encouraged to consider how their values may have shifted over time.

Participants are then taught strategies to make decisions guided by their cherished values, as opposed to more immediate desires or states. Values awareness involves bringing values to mind when making eating and physical activity decisions, and may entail utilizing visual and written reminders (e.g. a picture in a wallet, or post-it-notes) to remind participants about their values, even in the day-to-day bustle of life. An awareness of one's values is considered to be particularly key during weight control decision points, such as when deciding whether to exercise, or when deciding whether to have a second helping. Participants are taught to evaluate when a decision is consistent with their values (i.e., an "up vote") or is inconsistent with their values (i.e., a "down vote"). Values work may comprise various additional topics, such as how to integrate multiple values (e.g., spending time with loved ones *and* eating healthfully), prioritize multiple values (e.g., valuing work but leaving work early some days in order to exercise), or make values-consistent decisions in the face of challenges (e.g. social pressures).

Weight Loss Focused ABTs Within acceptance-based interventions, there is heterogeneity in the emphasis of these three components and the strategies utilized. In certain ABTs, the core components of *mindful decision making*, *willingness* and *valued living* serve to help people implement core behavioral strategies (e.g. self-monitoring) and adhere to the calorie and physical activity goals of standard lifestyle modification therapy (Forman et al., 2013, 2016). According to such "weight loss focused ABTs," if participants are able to adhere to calorie and physical activity goals, treatment would be effective. Yet, these behaviors are tremendously challenging to implement in daily life and necessitate additional acceptance- and mindfulness-based strategies.

For instance, in standard behavioral lifestyle modification interventions, self-monitoring calorie intake is considered a cornerstone of treatment success. Yet, many people struggle to do so consistently and accurately, and self-monitoring non-adherence is robustly associated with poorer treatment outcomes. A milieu of internal experiences may pull people away from self-monitoring, making compliance difficult. For example, people may have thoughts such as "this will take too much time," or "I'd feel terrible if I knew exactly how much I ate." People may also need to tolerate unpleasant emotions (e.g., boredom) and reductions in pleasure (e.g., taking the time to track calories rather than watching more of an enjoyable movie). In this example, *mindful decision making* would entail observing and accepting all thoughts and emotions that arise. *Willingness* would entail choosing to track calories, regardless of these thoughts and feelings. And *valued living* would entail

remembering the “why” behind weight loss—that is, viewing calorie tracking as in the service of personally meaningful health-related value, such as being a vivacious and energetic grandparent. In this way, weight loss focused ABT would enable people to implement this core behavioral strategy (self-monitoring), and thus benefit from treatment.

Values Focused ABTs Alternative versions of ABT place greater focus on valued living, and lesser focus on weight loss per se (e.g., Lillis et al., 2020; Lillis & Kendra, 2014). These “values focused ABTs,” sometimes called Values-Based Healthy Living (VHL; Lillis et al., 2020), view a laser focus on weight loss as problematic because such a focus could impede psychological flexibility through avoidance (e.g., avoidance of weight-related criticism from self or others, or feelings of guilt). In values-focused ABTs, the source of motivation matters, and weight-control behaviors are encouraged in so far as they are in-line with an individual’s values. The same behavior (e.g. refusing a second helping of cake at a party) could be maladaptive for one individual, yet adaptive for another. For instance, this decision could be maladaptive if motivated by self-hatred or disgust, yet adaptive if perceived as a step towards an important personal value (e.g., a long-lived life with loved ones). Values are conceptualized as flexible, long-term sources of motivation, while avoidance is conceptualized as a potentially effective motivator in the short-term, yet detrimental in the long-term.

As in weight loss focused ABTs, values focused ABTs aim to help participants identify and clarify their values, and have an awareness of those values when making decisions (Lillis et al., 2020). Values are clarified through a variety of exercises, including writing, group discussion, guided visualizations, and reflection. Participants are encouraged to identify ways in which their health-related decisions can empower important personal values, such as being a present and energetic grandmother, or being a role model in one’s community. Through connecting weight control and health decisions to important personal values, health behaviors are proposed to become more satisfying and sustainable in the long-term. As in weight loss focused ABTs, the connection between various weight control behaviors (e.g., healthy eating and physical activity) and valued living is emphasized and serves as a deep source of motivation which individuals can draw upon to brave the inevitable challenges of weight control. Yet, in contrast to weight loss focused ABTs, values focused ABTs place great emphasis on valued living more broadly. In this way, ACT features more prominently in values focused ABTs, and ACT exercises unrelated to health are included. For example, individuals are encouraged to explore values in their life more generally and monitor even values-consistent behaviors unrelated to weight loss.

Research Support and Future Directions

Mindfulness-Based Interventions (MBIs)

MBIs have consistently been found to decrease problematic eating behaviors related to obesity, such as emotional or stress eating, impulsive eating and binge eating (Carrière et al., 2018; Daubenmier et al., 2011; Katterman et al., 2014; Levoy et al., 2017; O'Reilly et al., 2014). A 2017 meta-analysis, for example, found that MBIs had a negative effect on impulsive eating ($d = -1.13$) and binge eating ($d = -.90$) (Ruffault et al., 2017). More limited research suggests that MBIs promote healthy behaviors conducive to weight control, such as reduced caloric intake, healthier eating choices, and increased physical activity (Barnes & Kristeller, 2016; Loucks et al., 2019; Marchiori & Papias, 2014; Ruffault et al., 2017; Seguias & Tapper, 2018). In a laboratory study, for example, participants who ate lunch while cued to focus on the sensory properties of the meal, as opposed to those in the control condition who ate in silence, subsequently ate more calories from snacks ($d = 1.14$) (Seguias & Tapper, 2018), and a 2017 meta-analysis found that MBIs had a positive effect on levels of physical activity ($d = .42$) (Ruffault et al., 2017). Yet, the effects of MBIs on weight loss itself have been mixed (Loucks et al., 2019; Olson & Emery, 2015; O'Reilly et al., 2014; Rogers et al., 2017).

For example, in a systematic review of mindfulness meditation-focused interventions for binge eating, emotional eating and weight loss, Katterman et al. (2014) identified ten studies that assessed weight as an outcome. Statistically significant changes in BMI were observed in the mindfulness intervention group in three of the studies (Cohen's d s between -0.09 and -3.29). Statistically significant weight losses were only observed in studies in which weight was a primary outcome measure, indicating that MBIs may only affect weight if it is explicitly targeted within treatment. The greatest weight loss (1.7 kg over 6-weeks) was observed in Timmerman and Brown (2012), potentially because mindfulness training was paired with behavioral goal setting—a strategy known to promote weight loss within the current gold-standard behavioral weight loss treatments (Ammerman et al., 2002). However, no studies showed a move from obese to normal weight (Katterman et al., 2014).

A recent meta-analysis of MBIs for weight loss and eating behaviors (Carrière et al., 2018), identified 18 studies that included weight as an outcome. At post-treatment, average weight loss was 3.1 kg (3.3% of initial body weight), and at follow-up, which occurred, on average, 16.26 weeks following treatment, average weight loss was 3.4 kg (3.5% of initial body weight). The authors found a moderate effect of MBI on weight loss in pre-post analyses (Hedge's $g = .42$), and a low-to-moderate effect of MBIs on weight loss in between-group analyses comparing MBIs to control conditions, though heterogeneity in control conditions precludes definitive conclusions. Seven studies compared MBI to an active control condition. Overall, the MBI condition produced low weight losses (on average, 3% of initial body weight), and these were less than the weight losses of the relatively weak

comparison conditions (on average, 5%). However, weight loss was maintained at follow-up (12–48 weeks) in the MBI conditions, whereas some weight regain was observed (approximately 0.4%) in the control conditions. Similarly, Loucks et al. (2019) found that a mindfulness-based blood pressure reduction program produced a significant BMI reduction (0.3 kg/m²) at 3-month follow-up in individuals with overweight/obesity. Future research is needed to investigate the possibility that MBIs could produce longer-term weight loss or maintenance, and a major limitation of existing trials of MBIs is their short follow-up durations.

Overall, while MBIs for binge eating have an established research base (Godfrey et al., 2015; Ruffault et al., 2017), less is known about how MBIs might produce weight loss amongst individuals with obesity, potentially due to the high levels of heterogeneity with regards to target population, target outcomes (e.g., eating dysregulation, stress eating, weight loss), intervention duration (6–12 weeks), intensity (e.g., the amount of daily mindfulness meditation practice encouraged). A better understanding of active treatment ingredients, the needed intensity/duration of treatment, and optimal target outcomes could increase the effectiveness, precision, and scalability of MBIs.

Of note, while the role of MBIs on total weight loss is unclear, MBIs improve outcomes related to overweight, such as blood pressure (15.1 mm Hg reduction in SBP among individuals with hypertension at 1-year follow-up), and the health of foods selected (e.g., eating according to the DASH diet, Loucks et al., 2019). Thus, there is preliminary evidence that MBIs are efficacious interventions for health promotion, or adjunct interventions to weight loss. However, larger randomized trials need to be conducted. Many standard lifestyle modification interventions are distinct from MBIs in that they teach participants to override cravings and overeating by adhering to external guidelines (e.g., calorie targets), and a challenge of MBIs for weight loss is the integration of content on tuning into one's inner wisdom (e.g., hunger, fullness, taste satiety), with outer wisdom, or an awareness of calorie content and nutrition. Future research should determine whether some components of MBIs are more effective than others, and whether these components would engage the effects of other treatment approaches, such as standard lifestyle modification. In addition, future research would benefit from further examination of whether MBIs are especially effective for certain subgroups of participants, such as those who engage in binge eating or have higher levels of impulsivity.

Research on MBIs for weight loss is relatively new. In addition to being limited by smaller sample sizes and shorter follow-up periods, there are a paucity of studies examining potential process measures. MBIs appear to be effective to the extent to which they increase levels of mindfulness (Carrière et al., 2018). However, many studies do not include validated mindfulness measures, making it difficult to ascertain whether mindfulness (as opposed to a related or complementary skill, such as emotion regulation) accounts for intervention effects. Recent research suggests that MBIs target various processes related to problematic eating, including emotion-regulation, self-control, and self-awareness (Loucks et al., 2019). Additionally, because most MBIs incorporate several different strategies (e.g., general mindfulness meditation, mindful eating exercises, and sometimes behavioral and cognitive

skills, such as instruction in weight management approaches and relapse prevention), it remains unclear which components of treatment are active treatment ingredients. For example, it is not clear the extent to which formal mindfulness meditation practice vs. mindful eating is important for MBIs. Future research would benefit from examining process measures, moderators of treatment outcomes, and evaluating which components of treatments are active ingredients for weight loss over longer follow-up periods.

Additionally, the generalizability of findings remains unknown. To-date, study participants have primarily been women and members of non-minority racial/ethnic groups (e.g., Kristeller et al., 2014; Loucks et al., 2019), and practitioners are typically highly trained. Relatedly, future research would benefit from examining how interventions could be scaled to reach a larger population.

Acceptance-Based Behavioral Treatments (ABTs)

ABTs have been established as an efficacious treatment, capable of producing clinically significant levels of weight loss (Butryn et al., 2017a, 2021; Forman et al., 2013, 2016; Lillis et al., 2016). Whereas MBIs produce no weight loss or modest levels of weight loss (e.g. Katterman et al., 2014), ABTs have been shown to be capable of producing clinically significant levels of weight loss of approximately 12–14% of initial body weight after year-long intervention periods (Butryn et al., 2017a; Forman et al., 2013, 2016).

Over the past 10 years, accumulating research has compared the efficacy of ABT and standard lifestyle modification interventions for weight-control, and five randomized controlled trials have compared intensive ABTs to active control conditions, such as standard behavioral treatment. Results have been mixed. In one trial that focused upon providing participants with skills to tolerate aversive experiences (e.g., cravings, and negative emotions and thoughts), ABT was found to produce superior weight loss over the course of treatment, but only under certain conditions. That is, when delivered by expert as opposed to novice interventionists, ABT produced greater weight loss (13.2%) than the standard lifestyle modification condition (7.5%) (Forman et al., 2013). In a later iteration of the manual that focused upon providing participants with skills to tolerate reductions in pleasure (e.g., choosing the lower calorie option even if less delicious) ABT produced greater weight loss (13.3% of initial body weight) than a standard lifestyle modification condition (9.8% of initial body weight) after a 1 year intervention period (Forman et al., 2016).

Yet in other studies that combine ABT with other intervention materials, ABT and standard lifestyle modification interventions produced equivalent levels of weight loss (Butryn et al., 2021; Butryn et al., 2017a). In one trial, ABT was combined with skills to help participants modify their home food environment and more easily navigate the obesogenic environment (Butryn et al., 2017a). In another trial, ABT was paired with additional materials emphasizing physical activity promotion (Butryn et al., 2021). In both trials, weight losses observed in the combined ABT

conditions did not differ from that observed in the standard lifestyle modification conditions, potentially because the overall amount of ABT content delivered was decreased, or because content focused on willingness and values clarity to the exclusion of mindfulness. Together, this research suggests that ABT may only outperform standard lifestyle modification treatments when mindfulness- and acceptance-based components are delivered with sufficient intensity, although the exact dosage remains unknown. Future research would benefit from examining the intensity and duration of treatment needed to produce effects. Additionally, future research would benefit from examining the components of ABT needed to produce effects.

Despite these successes, a remaining challenge with treatments for obesity is their long-term effectiveness. In a trial by Forman et al. (2016), ABT produced greater percent weight loss than the standard lifestyle modification interventions *during* the intervention period (13.3 vs. 9.8%), though differences between conditions were not maintained at the 1 year follow-up (7.5% vs. 5.6%) or 2 year follow-up (4.7% vs. 3.3%) (Forman et al., 2019). ABT did, however, produce sustained improvements in subjective quality of life at follow-up, as measured by the Quality of Life Inventory (QOLI, Frisch et al., 1992), such that 50.5% of participants in the ABT condition vs. 27.8% in the standard lifestyle condition achieved clinically significant improvements in quality of life from baseline to 2-year follow-up, as operationalized by Frisch et al. (2005). This indicates that while ABT may not have enduring effects on weight loss, it may have enduring benefits outside of weight loss. Lillis et al. (2016) similarly found no significant weight loss advantage of ABT over a standard lifestyle modification condition at 1-year follow-up. However, a greater proportion of those in the ABT condition achieved the 5% benchmark of clinically significant weight loss (38% vs. 25%), suggesting a potential long-term advantage of ABT.

Some, though limited, research has explored potential moderators of treatment effects (Butryn et al., 2017a, 2021; Forman et al., 2013, 2016; Manasse et al., 2017). Due to ABT's focus on increasing acceptance of and willingness to experience unwanted internal experiences and decreasing automatic responses to internal and external cues, some researchers have hypothesized that ABTs would be especially effective for those with overall heightened reactivity to cues (e.g., cravings and emotions). Support for this hypothesis has been mixed. Some research has supported this hypothesis (Forman et al., 2013), for example finding that participants with higher levels of depressive symptoms, emotional eating, disinhibited eating, and reactivity to the presence of highly palatable foods lost a greater amount of weight (1.94–6.55%) in an ABT condition as opposed to a standard lifestyle modification condition. Of note, the ABT condition in this trial focused upon building distress tolerance skills, and in a later version of the treatment that focused more generally upon tolerating reductions in pleasure, no significant moderating effects for these variables was found; instead ABT was equivalently effective for all participants (Forman et al., 2016). These differences in findings are likely attributable to differences in treatment focus: whereas the ABT condition in the earlier trial focused upon increasing tolerance of aversive states (e.g., sadness), the ABT condition in the

latter trial focused more generally upon increasing tolerance of reduction in pleasure or comfort (e.g., selecting a less pleasurable food).

One related study found support for the moderating role of impulsivity (Manasse et al., 2017). Participants with greater levels of impulsivity experienced greater weight loss (approximately 4–7% less, depending on the measure of impulsivity) in the ABT condition than in the standard lifestyle modification condition, potentially because certain ABT strategies (e.g., urge surfing) enable people to observe and tolerate negative states (e.g., cravings and urges) rather than act upon immediate impulses (e.g., to eat high calorie foods).

In three of our trials (Butryn et al., 2017a, 2021; Forman et al., 2016) we have observed that ABT helps address the usual health disparity in efficacy of weight loss treatments for White versus Black participants. Trials of behavioral weight loss consistently find that weight losses are lower for African American/Black participants compared to non-Hispanic White participants (Goode et al., 2017). For example, in two of the largest and most rigorous behavioral weight loss trials, weight losses in White participants were found to be 40–50% higher than amongst Black participants (Diabetes Prevention Program Research Group, 2004; West et al., 2008). In contrast, ABT appears to improve weight loss outcomes for Black participants. For example, in a trial in which adults with overweight or obesity were assigned to a condition combining ABT with skills to modify the home environment, or to non-ABT conditions, Black participants lost more weight in the ABT condition than in the non-ABT conditions at post-treatment (9.4% vs. approximately 6%) and 24-month follow-up (6.3% vs. approximately 4%) (Butryn et al., 2017a, b). Similarly, in a trial targeting physical activity promotion, Black participants in the ABT condition lost more weight (14.1% of initial body weight) than in the standard behavioral weight loss condition (9.4% of initial body weight) (Butryn et al., 2021). Finally, in a trial comparing ABT to a standard lifestyle modification intervention, Black participants in the ABT condition as opposed to the standard lifestyle change condition lost more weight at follow-up (11.3% vs. 8.6% of initial body weight) and at 24-month follow-up (6.0% vs. 3.6%) (Forman et al., 2016, 2019).

These preliminary findings warrant further investigation, and the mechanism behind it is unclear. Potentially, these effects are due in part to the *valued living* component of ABTs, given that this component allows participants to personalize their motivation for weight control, and African Americans often report lower pre-existing desires to be thin (Vaughan et al., 2008). Additionally, the willingness component of ABT may be especially pertinent to African Americans, who face challenges above and beyond an obesogenic environment. For example, African Americans encounter stress due to interpersonal and systemic racism (Mays et al., 2007), and may face additional cultural (Hall et al., 2013) or environmental challenges (James et al., 2012; Lynch et al., 2007) related to health and weight control.

A general limitation of ABTs, is that it is unclear which components of treatment are active treatment ingredients, given that components are typically administered in comprehensive treatment packages. Future work would benefit from disentangling this, which could aid in the disseminability and cost-effectiveness of future interventions. Additionally, more work is needed to examine a greater variety of

process measures. Limited work has examined mechanisms of change, and the work that has largely relies upon self-report measures. Process measures examined to-date include experiential avoidance, or unwillingness to experience internal experiences, such as thoughts, feelings and sensations (Forman et al., 2013, 2016; Lillis et al., 2017; Niemeier et al., 2012; Schumacher et al., 2019), internal disinhibition (Lillis et al., 2016; Niemeier et al., 2012), physical activity intentions (Godfrey et al., 2019) and values-linked mediators, such as autonomous motivation (Forman et al., 2016; Lillis et al., 2017).

At present, the greatest body of research has examined experiential avoidance as a mechanism of change. Research has not supported general experiential avoidance, assessed with the Acceptance and Action Questionnaire (AAQ; Bond et al., 2011; Hayes et al., 2006), or weight-related experiential avoidance, assessed with the Acceptance and Action Questionnaire for Weight-Related Difficulties (AAQW; Lillis & Hayes, 2007), as mediators of treatment effects (Lillis et al., 2017; Niemeier et al., 2012; Schumacher et al., 2019). On the other hand, support has been found for the mediating role of food-related experiential avoidance (i.e., an unwillingness to experience internal experiences such as cravings) as assessed with the Food Craving Acceptance and Action Questionnaire (FAAQ; Juarascio et al., 2011; Forman et al., 2013, 2016; Schumacher et al., 2019).

Further work into potential predictors, maintenance factors, and process measures could inform the development of ABT and establish precise treatment approaches tailored to different subsets of people seeking weight loss. In addition, the generalizability of ABTs for weight loss is unknown, since participants are typically highly motivated, and clinicians administering the treatment are generally highly trained and from a limited number of research groups in the U.S.

Of critical importance, weight regain occurs following existing treatments, including ABTs. ABTs may only be effective in the long-term if treatment is continued, such as with booster sessions. Further research into how (e.g., in-person, through smart phones) and in what dose, to continue ABT treatment so as to maintain weight loss gains long-term is needed. Additionally, novel approaches to weight loss capable of producing enduring effects are needed.

Conclusions

While weight loss treatments can produce short-term weight losses, little is known about how to produce long-lasting weight change. Traditional lifestyle modification interventions for weight loss teach people how to modify their food intake, environment, and thoughts. Third Wave treatments for obesity propose that these modifications are insufficient, and that challenging internal experiences, environmental barriers, and poor recognition of physical hunger, taste satisfaction and satiety cues will remain given the tremendous difficulty of living in an environment with easy access to hyper-palatable, calorie dense foods, and with a biological preference for such foods. Third Wave treatments for obesity thus equip individuals with

mindfulness and acceptance-based strategies to observe, rather than react to or change, internal experiences (e.g. thoughts, feelings, cravings and urges), and to intentionally choose behaviors in line with biological hunger signals, goals or values, even in the face of challenging internal experiences.

In this chapter, we reviewed two main types of Third Wave treatments for obesity. The first, MBIs, focus on cultivating a general nonjudgmental, open awareness of the present moment, as well as an ability to distinguish, label and observe specific eating-related experiences, such as hunger, fullness, and taste satiety. The overarching goal of MBIs is to disrupt automatic or habitual patterns of eating, and enhance self-regulation related to eating, emotions, and behavior. ABTs teach individuals to be aware of factors that influence eating and physical activity decision-making, and then to select behaviorally based weight control strategies (e.g., calorie reduction and physical activity promotion) that are consistent with personally meaningful values, as opposed to desires to reduce or avoid unwanted experiences (e.g. cravings, negative emotions, discomfort).

Mixed research supports the efficacy of MBIs for weight loss; however, MBIs produce various eating-related benefits, including reduced stress and more regular eating patterns, suggesting that mindfulness could be a valuable component to integrate into treatments. ABTs are a viable alternate to traditional lifestyle modification, producing equivalent or superior levels of weight loss as current gold-standard weight loss treatments over intervention periods, though weight regain occurs in the absence of weight maintenance treatment. For both MBIs and ABTs, much remains to be learned regarding what exact treatment components are effective, and the process mechanisms underlying observed effects. Such research is important in increasing the effectiveness, precision, and scalability of treatments.

Of critical importance, while Third Wave treatments for obesity contribute to the field by offering novel applications of strategies for weight loss and related issues (e.g., emotional eating), little is still known about how to produce sustained, long-term weight loss. Only by attending to the complicated interplay of social, environmental, biological, and internal experiences, and by precisely examining active treatment ingredients, process measures and contextual factors, will progress on this front be made. Given the numerous and complex contributors to overweight, creative solutions to the obesity epidemic capable of producing lasting change are needed.

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