Mindfulness has had a presence within health psychology since the 1980s, with research growing rapidly in the last decade (Dimidjian & Segal, 2015). Mindfulness can be considered both as universal human capacity and as a skill that promotes self-regulation within the mind-body system. This chapter reviews conceptual models of mindfulness, ways in which it can be cultivated, and evidence for applications across a range of biopsychosocial functions.

From Traditional to Contemporary Theory and Practice

The definition of mindfulness put forth by Jon Kabat-Zinn in 1990 continues to be widely referred to: bringing non-judgmental sustained awareness to an object of attention (Kabat-Zinn, 1990). In a related definition, it is a state in which there is receptive and open attention to present-moment experience (Bishop et al., 2004). Yet how to define, utilize, and measure the construct of ‘mindfulness’, both conjointly with meditation practice and independent from it, continues to evolve, raising challenges for research and for clinical application (Baer et al., 2008; Van Dam et al., 2017).

Interest in mindfulness as a therapeutic psychobiological modality developed as part of a broader exploration of meditation-based practices beginning in the 1960s with the introduction of mantra-based meditation, including Transcendental Meditation (TM) (Wallace, 1970), drawn from Hindu-based traditions. Herbert Benson, a prominent Harvard cardiologist, secularized TM to investigate cardiac effects and stress, popularizing it in his book “The Relaxation Response” (Benson, 1975), and expanding its use into a multi-session group program (Kutz, Borysenko, & Benson, 1985). Other early research was exploring effects of meditative approaches on self-regulation (Cuthbert, Kristeller, Simons, Hodes, & Lang, 1981; Davidson, Goleman, & Schwartz, 1976). Within these practices and traditions, the mind and body are viewed as inherently linked, and this research began contributing to the development of mind-body medicine.

Also emerging during this time was interest in Buddhist-based approaches to understanding psychological distress and well-being. Originally focused on Japanese Zen Buddhist practices, this shifted to Vipassana traditions from Southeast Asia, within which mindfulness-based practices were a primary modality, followed by growing influence from Tibetan Buddhism (Goleman & Davidson, 2017; Shonin, Van Gordon, & Singh, 2015; Smith & Novack, 2003; Walsh & Shapiro, 2006). Although initially conveyed as religious practice, Buddhism, unlike Western traditions, does not draw strong lines between religious, philosophical, and psychological thought. Human distress within Buddhism is viewed as having its source in the continuous struggle between desire and fear, attachment and
avoidance, arguably compatible conceptually with psychological theory. Mindfulness is viewed as a means to separate one’s sense of self from these struggles by simply observing experiences, thereby weakening conditioned and/or hard-wired reactions. This helps people shift from ‘reaction’ to ‘response’, whether faced with chronic pain or an addictive craving (Brewer, Elwafi, & Davis, 2013). Traditionally, the next level of practice is referred to as engaging ‘insight’ or ‘wisdom’, as alternative choices emerge in consciousness, yet without a sense of struggle, need for willpower, or strong self-control (Germer & Siegel, 2012; Kristeller & Wolever, in press). As a measurable human trait, dispositional mindfulness is associated with higher levels of self-regulation and positive health independent of specific training, yet responsive to it, generating an increasingly substantive literature (Carmody & Baer, 2008; Loucks, Britton, Howe, Eaton, & Buka, 2015; Quaglia, Braun, Freeman, McDaniel, & Brown, 2016).

Early application of mindfulness to health psychology began in 1979, as Kabat-Zinn, linking his background in Zen, Vipassana, and yoga, with cognitive behavioral and structured group approaches, began to offer the Stress Reduction and Relaxation Program for chronic pain patients at the University of Massachusetts Medical School. Although the name implies that the primary mediating process was conceived of as ‘stress management’, the value of the program was always envisioned as far broader, incorporating mindfulness to help people engage more positively with their body, and manage the reactivity and reduced sense of functioning associated with chronic pain. As early research showed sustained value out to four years (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, Burney, & Sellers, 1986), the program began to include individuals with a wider range of issues. Renamed the Mindfulness-Based Stress Reduction (MBSR) program about 10 years later, MBSR incorporates multiple components: sitting meditation, with a focus on the breath, and other feelings and thoughts as they arise; a deep body scan practice; gentle yoga and mindful walking; and focused discussion, provided in a two-hour format over eight weeks, with continued practice on a daily basis.

The MBSR program became a model for other mindfulness-based interventions (MBI), such as Mindfulness-Based Cognitive Therapy (MBCT) for depression (Segal, Williams, & Teasdale, 2013), the Mindfulness-Based Eating Awareness Program (MB-EAT) for treatment of obesity and binge eating (Kristeller & Wolever, in press), and Mindfulness-Based Cancer Recovery (MBCR) (Carlson et al., 2016). These variants of MBSR include focused practices on targeted issues. For example, MBCT heightens awareness of cognitions and feelings related to depressive triggers; MB-EAT incorporates guided practices related to hunger, eating and satiety, and body issues, as a way to develop ‘wiser’ and more flexible eating, far different from structured prescribed diets (Kristeller, 2015). Focused practices bring attention to particular aspects of experience pertinent to therapeutic goals.

MBIs and related programs are now taught worldwide. Valuable perspectives on cultural influences, in settings as diverse as Italy, Israel, Korea, and South Africa, are presented in Resources for Teaching Mindfulness (McCown, Reibel, & Micozzi, 2016). Mindfulness is also incorporated into ‘third wave’ therapies, including Dialectical Behavior Therapy (DBT) (Linehan, 1993; Linehan & Wilks, 2015) influenced by Zen traditions, and Acceptance and Commitment Therapy (ACT) (Hayes, Follette, & Linehan, 2004). MBIs continue to be developed for different treatment contexts, such as individual therapy, and for various populations, including children (Baer, 2014; Germer, Siegel, & Fulton, 2005).

Value and Outcomes of Mindfulness Practice

How does mindfulness contribute to therapeutic goals? Within traditional Buddhist teachings, heightening awareness, focus and insight are core, encompassing the experiences of both the body and the mind (Smith & Novack, 2003). Early in contemporary research, the focus was primarily on reduction in emotional and physical stress effects. And as noted earlier, the processes involved appear compatible with conditioning theory, as expressed in research on behavioral self-regulation. More recently, research has re-engaged more traditional aspects of mindfulness practice: relationship to self
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and others, and spiritual engagement, with a message that these should also be held in respect (Har- rington & Dunne, 2015).

Theory and Research of Mindfulness Practice

This next section provides an overview of the theory and research of mindfulness practice as relevant to health psychology. The multi-domain model of mindfulness organizes effects within six areas of psychobiological functioning: cognitive, physiological, emotional, behavioral, relation to self and others, and spiritual (Kristeller, 2007). All inherently interact, but draw on somewhat distinct mechanisms. Any single clinical target for applying mindfulness practice may engage selected areas—or all of them.

Mindfulness and Cognition

Mindfulness is inherently a cognitive process, in that it cultivates and heightens individuals’ ability to focus attention at will, helps disengage dysfunctional thinking or other types of reactions, decreases mind wandering, facilitates meta-cognitive processes, executive functioning, and accessing the ‘wise’ mind (Bishop et al., 2004; Mason et al., 2007; Raffone, Srinivasan, & Barendregt, 2014; Vago & Zeidan, 2016). If there is a single mediating process, this is undoubtedly it, distinguishing mindfulness from a wider range of “relaxation” practices. Evidence, although still somewhat mixed, has shown brain growth/thickening in these areas: in the insula and somatosensory areas, involved with emotional and body self-awareness; in those parts of the PFC involved in paying attention and meta-awareness; and in areas of the cingulate cortex and orbitofrontal cortex involved in self-regulation (Fox et al., 2014; Goleman & Davidson, 2017; Lazar et al., 2005).

A frequent question relevant to these cognitive processes concerns use of a mantra, a repeated word or phrase, as the focus for practice. Some mindfulness traditions use mantras for initial training, as a mantra is cognitively more concrete than the breath, and indeed can be helpful to use clinically for those struggling with Attention Deficit Disorder, or for anyone to quiet an agitated or wandering mind. However, because the breath is cognitively neutral, it is a more powerful tool to bring a quality of mindfulness into any situation or to any experience.

Underlying the value of cultivating breath awareness is the core of mindful awareness: accessing a neutral internal space that disengages over-conditioned patterns of judgment, pain, anxiety, or risky health behaviors, such as over-eating or smoking. In considering the cognitive processes involved, the distinction between ‘responding’ versus ‘reacting’ is key (Smart & Segalowitz, 2017). Repeatedly engaging mindfulness to whatever arises into awareness, whether during mindful practice or at other times of the day, appears to counteract the challenge of the negatively toned ‘wandering mind’ (Vago & Zeidan, 2016), loosening core patterns of conditioning, and opening the mind to other alternatives.

Physical and Health Effects

Mindfulness practice is associated with an increase in physical relaxation for most individuals, related to slower breathing and shifts in parasympathetic/sympathetic balance in the autonomic system activity (Delgado et al., 2010; Wolever et al., 2012). A novel cross-over design of the use of mindfulness in African-American men with kidney disease documented that blood pressure and other ANS indicators improved with only a single session of mindfulness training but not with controlled breathing alone (Park, Lyles, & Bauer-Wu, 2014).

Chronic pain is a particularly clear example about of how mindfulness may limit reactivity, thereby modulating the pain experience itself. Hilton and her associates (2016), in a meta-analysis,
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found mixed evidence for actual pain reduction, but consistent decreases in pain-related depression. Zeidan and Vago (2016) review the mechanisms of how mindfulness experience, deepening with practice, assists in modifying pain experience, clinically and at a neuropsychological level.

Effects on immune system functioning have been explored in cancer care, immune disorders, and immune system responses with largely positive results (Black & Sla\'vich, 2016). An early randomized controlled trial (RCT) compared standard light therapy for psoriasis, an autoimmune disorder, to light therapy combined with brief mindfulness practice, which produced markedly faster skin clearing (Kabat-Zinn et al., 1998). Breast and prostate cancer patients enrolled in an MBSR program showed lowered levels of pro-inflammatory cytokines, correlated with amount of practice (Carlson, Speca, Faris, & Patel, 2007). In the intriguing emerging area of research on telomere length (the cap at the end of DNA strands) as a marker of health, longer telomeres have been found in experienced meditators (García-Campayo et al., 2017), and effects of mindfulness-based interventions on increases in telomere length have been documented (Schutte & Malouff, 2014).

Mindfulness and Emotion

Emotional distress contributes to disease vulnerability and adjustment to illness. Further, emotions are expressed and experienced within the body. Mindfulness is now well documented to play a role in improved emotional regulation, decreased reactivity, and enhanced well-being (see Goleman & Davidson, 2017, for an integrated overview of this work). After only a few weeks of breath-awareness practice, individuals have demonstrated subtle shifts in amygdala/pre-frontal lobe connectivity in response to emotional challenges (Doll et al., 2016).

Various emotional states have showed substantive response to mindfulness practice. In early research on MBSR and anxiety, individuals with anxiety disorders and panic attacks showed rapid improvement, sustained at three years (Kabat-Zinn, Massion, Kristeller, & Peterson, 1992; Miller, Fletcher, & Kabat-Zinn, 1997). For individuals with generalized anxiety disorder, MBSR showed similar improvement to a stress management program in symptoms and decreases in amygdala activity related to anxiety (i.e., the ‘relaxation effect’) and MBSR produced stronger neuro-linkages to frontal areas of the brain, suggesting more systematic enhancement of self-regulatory processes (Hölzel et al., 2013).

An MBSR intervention conducted in Iran with male cardiac patients found significant improvement in systolic BP, stress, and anger (Momeni, Omidi, Raygan, & Akbari, 2016). Carlson’s extensive work adapting MBSR for cancer patients, including an online version, has shown consistent improvement in emotional well-being, maintained for one year (Carlson, 2012; Carlson et al., 2007; Zernicke et al., 2016).

Mindfulness and Behavior

There are various ways in which mindfulness helps regulate behavior. At higher levels of neurocentral regulation, these include disruption of conditioned patterns, slowing reactivity, and improving self-regulation as awareness is cultivated. Experiences of craving also may be interrupted, first conceptualized by Marlatt as ‘surfing the urge’ in relation to his work with mindfulness in alcohol treatment (Bowen, Chawla, & Marlatt, 2011). This transfers readily to eating regulation and smoking cessation. Research based on this model found that a four-week, eight-session MBI was significantly better than the American Lung Association’s Freedom from Smoking Cognitive Behavioral Treatment (CBT) program at four-month follow-up (31% vs. 6% abstinence) (Brewer et al., 2011). Furthermore, changes in the relationships between craving and smoking from baseline to follow-up were moderated by amount of both formal (body scan; breath awareness; and loving kindness practice) and informal (bringing mindfulness to related experiences during the day) mindfulness practice that
participants recorded (Elwafi, Witkiewitz, Mallik, Thornhill, & Brewer, 2013). A meta-analysis of four mindfulness-based smoking intervention trials showed similar effects (25.2% vs. 13.6% abstinence) (Oikonomou, Arvanitis, & Sokolove, 2017).

Within the MB-EAT program, clients realize they no longer crave foods that had previously triggered binges, reporting a sense of “release” from struggling to manage these earlier patterns, distinct from engaging either ‘self-control’ or ‘willpower’, followed by ‘wiser’ alternatives emerging (e.g., choosing healthier foods or alternative ways to handle stress). Guided mindfulness practices are central to this process, bringing non-reactive attention to experiences of hunger, taste, and fullness. In an RCT, both the MB-EAT group and a Psycho-Ed/CBT group showed greater improvement than a waitlist control on outcome measures, including weight regulation, but the MB-EAT group had greater decreases in binging; further, weight loss related to overall mindfulness practice, including formal sitting practice and incorporation of mindfulness into daily activities (Kristeller, Wolever, & Sheets, 2013). In a related RCT, decreases in reward-driven eating accounted for weight loss up to one year in the mindfulness condition, but not in the diet-exercise condition (Mason et al., 2016).

**Relationship to Self and Others**

A classic effect of mindfulness practice is to shift investment in one’s self-focused needs, moving from self-judgment to self-acceptance, and extending compassion to oneself and others. These shifts occur as the ‘self’ becomes less engaged by conditioned attachments and aversions, via use of focused practices such as traditional ‘loving kindness’ meditations (Hanh, 1997). One of the mediating mechanisms in adjustment to chronic pain in the MBSR program appears to be a defusing of self-identity with the pain experience, including self-judgment and self-blame, an important element in dealing with many medical and health conditions (Dima, Gillanders, & Power, 2013). Work on mindful self-compassion extends and deepens that self-acceptance to self-compassion through guided practices (Germer & Neff, 2013).

Relationship to self and others can extend into working with patients in the health care setting. Krasner (2016) provides guidelines for training medical professionals in cultivating mindful engagement in the physician-patient relationship. McBee (2016) outlines ways for caretakers, whether family members or staff, to engage mindfully with frail elderly. Research in Australia found that a brief Mindful Self-Care and Resiliency intervention for nurses (a one-day workshop plus three weekly sessions) decreased burnout and depression, and increased compassion satisfaction, sustained at six-month follow-up (Slatyer, Craigie, Heritage, Davis, & Rees, 2017). These results are consistent with meta-analytic reviews of similar studies with a broader range of health care providers (Gilmartin et al., 2017).

**Spiritual Experience and Well-Being**

Meditative practices are historically embedded in spiritual and religious traditions. As evidence grows supporting the substantive role of spiritual and religious engagement in adjusting to health challenges, particularly those that are life-threatening (Salsman, Fitchett, Merluzzi, Sherman, & Park, 2015), the documented value of meditative practice for cultivating spiritual well-being, even within secular programs, speaks to this inherent value of mindfulness practice. For example, increases in spiritual well-being during the MBSR program correlated with increased physical well-being and reduced stress (Carmody, Reed, Kristeller, & Merriam, 2008). Carlson et al. (2016) found greater increases in spiritual well-being for cancer patients in her MBCR program compared with those receiving supportive expressive therapy, maintained after 12 months. Similarly, participants in the MB-EAT program showed increased levels of spiritual well-being that significantly related to improvement in eating regulation (Kristeller & Jordan, 2018).
Summary and Future Directions

As understanding of the theory and application of mindfulness-based approaches develops, this spurs continued exploration of the underlying mechanisms of mindfulness and future clinical use (Davidson & Kasznia, 2015). Application within health care is a particularly strong context for exploring mindfulness as a basic capacity, in regard to how it may promote self-regulation across broad areas of functioning, and modulate the considerable stress of medical illness. Another development in the last 10 years is increased documentation of the acceptability of mindfulness-based approaches, across cultures and socioeconomic backgrounds. Adapting MBIs to targeted health issues or populations is growing, yet investigation of standardized interventions, such as MBSR, also helps identify effects that vary by trait differences, quality of delivery, or underlying health and psychological issues. As the value of cultivating the capacity for mindfulness is increasingly documented, so is the need for expanded venues for providing high-quality mindfulness-based approaches, both clinically and within research contexts.

References


