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Mindfulness and Distress Tolerance: A Review of the Literature

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Abstract
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MINDFULNESS AND DISTRESS TOLERANCE: A REVIEW OF THE LITERATURE

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ABSTRACT

Research over the past several decades suggests that mindfulness-based interventions facilitate reductions in psychological distress associated with a range of clinical presentations. Although there have been a significant number of studies looking at the impact of mindfulness on symptom reduction, there have been far fewer studies looking at the effect of mindfulness training on distress tolerance. Distress tolerance refers to the ability to tolerate and withstand negative or unpleasant experiences, and involves a fundamental shift in the relationship that one has with their current experience. This review aims to take a closer look at the existing literature on mindfulness-based interventions, including the multifaceted construct of mindfulness itself, clinical applications, and the mechanisms of change believed to mediate positive treatment outcomes. The current state of research on distress tolerance is reviewed, as well as the mechanisms by which mindfulness is believed to facilitate increased distress tolerance and nonjudgmental acceptance of unpleasant experiences. Although mindfulness research on this topic appears to be promising, the precise mechanisms by which this shift occurs are yet to be clearly understood. The empirical research examining the relationship between mindfulness and distress tolerance is also discussed and future directions for research are identified.

Keywords: mindfulness; meditation; distress tolerance
Introduction

Mindfulness has been operationally defined in the West as “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). Buddhist meditation training, including mindfulness, has been found to be related to the reduction of psychological distress as measured by a range of symptoms including levels of depression, anxiety, hostility, and other distressing reactions to physical sensations and mental events (Ostafin et al., 2006). It is believed that the reduction in psychological distress often observed in mindfulness research may be mediated by several mechanisms (Coffey & Hartman, 2008).

During the 1970’s, meditation began to gain greater attention from psychological researchers and was considered by some to have significant therapeutic potential (Smith, 1975). Perhaps the best known figure in early mindfulness research in the West is a molecular biologist by the name of Jon Kabat-Zinn, who first introduced a structured mindfulness-based treatment protocol in 1979 at the University of Massachusetts Medical Center. He called the program mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990), and offered it to patients experiencing distress related to a range of clinical presentations including chronic pain, anxiety, hypertension, heart disease, cancer, and AIDS. Meta-analyses examining MBSR research over the past several decades suggests that mindfulness-based stress reduction is associated with a range of health benefits and is clinically useful in a wide variety of settings (Grossman, Niemann, Schmidt, & Walach, 2003).

Other mindfulness-based interventions, such as mindfulness-based cognitive therapy (MBCT) target relapse prevention in recurrently depressed individuals (Teasdale et al., 2000). Additionally, mindfulness-based treatment has been proposed as a promising approach for the
treatment of generalized anxiety disorder, and may facilitate decreases in pathological worry and stress (Craigie, Rees, Marsh, & Nathan, 2008).

Despite the therapeutic potential of mindfulness, empirical studies to date have not provided clear support for the efficacy of mindfulness-based treatments, due largely to inadequate control groups and small sample size (Baer, 2003; Toneatto & Nguyen, 2007). This has somewhat limited the ability of meditation researchers to attribute significant clinical change to the specific therapeutic variables of meditation as opposed to other variables (Chambless & Hollon, 1998; Smith, 1975). The primary purpose of this review is to examine the known clinical applications of mindfulness in psychotherapy and distress tolerance research, and to shed light on the underlying mechanisms of change believed to facilitate the increased distress tolerance often observed in mindfulness training. Additional areas for future research are also identified and discussed.

Meditation

The early Eastern practices of meditation are associated by many in the Western world with ideas of religion or mysticism. Over the past several decades however, interest in the clinical utility of meditation and mindfulness has led researchers to conduct studies on its efficacy when applied in the form of various psychotherapeutic interventions (Baer, 2003). Davidson et al. (2003) found that meditation was associated with increased activity in the left prefrontal cortex, one of the brain structures responsible for controlling positive emotions.

The practice of meditation involves a range of techniques deriving from a number of religious traditions. Although they share several common features, it is generally agreed upon that meditational techniques involve some type of alteration of attention, which is thought to
contribute to changes in the perception of the self in relation to the world (Valentine & Sweet, 1999). When practiced appropriately, meditation is thought to lead to greater concentration and freedom from distraction, increased tolerance of change, and greater awareness of physical and mental responses (De Silva, 1990).

Within this broad definition, two common variations of the practice include the concentrative and mindfulness forms of meditation, the latter of which will be the focus of this literature review. In concentrative or transcendental meditation, the practitioner selects and focuses their attention on an appropriate thought, and experiences its subtle states until the subtlest state is experienced (Maharishi Mahesh Yogi, 1963, p. 49). As mental events arise in a stream-like fashion, one following another, the individual attempts to experience the oncoming mental event at an increasingly earlier stage of its development (Maharishi Mahesh Yogi, 1963, p. 49). Transcendental meditators do not focus attention on the nature of distractions, and instead restrict the focus of attention to a single stimulus, such as a mantra, sound, object, or sensation (Baer, 2003).

In contrast, mindfulness meditation involves the process of intentionally observing the body and mind non-reactively, non-judgmentally, and with an open heart, while embracing the individual experience and accepting things as they are (Kabat-Zinn, 1990). Although both types of meditation involve a deliberate focus of attention, mindfulness tends to foster awareness of a broader range of experience and phenomena. Olendzki (2008) uses the analogy of concentrative meditation being akin to a spotlight, whereas mindfulness meditation might be more analogous to a floodlight, illuminating the entire present moment experience.

Mindfulness meditation has been shown to facilitate enhanced attention to and awareness of current experience or present reality (Brown & Ryan, 2003). The development of cognitive
flexibility allows the mind to welcome whatever arises, being with the experience rather than directing focus on only one thing such as the breath (Kabat-Zinn, 1990).

**Eastern Foundations**

Mindfulness is traditionally taught within the context of Buddhism. In seminal Buddhist texts, the Pali term for mindfulness (sati) is described as *awareness, attention, and remembering* (Seigel, Germer, & Olendzki, 2008). However, understanding the practice does not necessarily require one to subscribe to a religious belief. Rather mindfulness has been described as a particular way of paying attention that involves inquiry within oneself in order to gain a greater sense of self-understanding (Kabat-Zinn, 1990). It should be noted however that this operationalization of mindfulness and other attempts to define the phenomenon can only begin to convey the true essence of mindfulness. Indeed, mindfulness is a concept that one must come to understand experientially, and cannot adequately be described or understood through didactic instruction alone.

A typical mindfulness meditation might involve an exercise in mindfulness of breathing, where the focus of attention is directed toward the breath as it passes through the nostrils, chest, and abdomen. Noting the presence of the breath, whether it is relaxed or not, its duration, and so forth is thought to facilitate the development of mindfulness (Chah, 2004). No matter what type of mindfulness exercise is practiced, all involve bringing attention to the present moment.

The Zen Buddhist monk, Thich Nhat Hahn (1976) described mindfulness as keeping one’s consciousness alive to the present reality. The practice emphasizes living life in the present moment not only during formal meditation sessions, but also in everyday life (Hahn, 1976). According to Hahn (1976), this “state of peace and relaxation differs fundamentally from the
lazy, semi-conscious state of mind that one gets when resting or dozing. In mindfulness one is not only restful and happy, but alert and awake” (p. 60).

Ajahn Sumedho, a Buddhist Theravadin monk, described mindfulness as a method of living with the inherent uncertainties of life by having the presence of mind in the moment to “reflect upon and learn from life as we live it” (Sumedho, 2002, p. 6). During deep meditation one is believed to reach Samadhi, meaning the mind is attentive and focused with all encompassing mindfulness, constantly aware of the mental conditions that arise (Chah, 2004). Experienced meditators consciously alter their relationship to life experiences rather than by attempting to change the content of the experiences themselves (Rosch, 2007).

The Abhidhamma, translated as “higher doctrine,” is a set of the Buddha’s comprehensive teachings, which outlines 89 distinct types of consciousness and 52 mental states. One of these mental states, dukkha, can be loosely translated to mean “a painful feeling,” “basis of pain,” “object of pain,” “cause of pain,” or “conditioning state of pain.” One central focus of Buddhist teaching is to cultivate the wisdom to decrease the suffering and distress associated with dukkha.

The Secularization of Mindfulness

Over the past several decades, the secularization and attempted operationalization of mindfulness in Western science has allowed for its integration with a range of clinical interventions, which researchers have empirically examined with notable success. Operationalization has allowed for more consistent therapist training and competency, and made practical application possible for a larger number of clinicians and researchers (Dimidjian & Linehan, 2003). However, it is likely that the operational definitions of mindfulness in the West do not adequately address the clinically promising, but perhaps more spiritually oriented
components of mindfulness training that were originally taught in the Buddhist context (Dimidjian & Linehan, 2003). Further research is needed to explore the potentially therapeutic components of traditional mindfulness practice that may have been discarded by researchers and clinicians in the West for the purposes of more practical empirical study and clinical application.

Mindfulness in its Eastern spiritual context emphasizes impermanence of the self, and is believed to cultivate an understanding of the true nature of reality, leading to spiritual enlightenment. The secular definition, however, seems to focus more on the impermanence of mental events or experience as a method of alleviating distress or maintaining well-being (Ostafin et al., 2006). It appears that more spiritually related components of mindfulness have been largely withheld from Western clinical populations in an effort to maintain a divide between spirituality and science (Dimidjian & Linehan, 2003). Reintroducing mindfulness to its spiritual beginnings may improve clinical practice and treatment outcomes in ways that are not currently understood (Rosch, 2007). Thus, it may be important for researchers to take a closer look at the components of mindfulness that have not been adequately addressed in Western research due to the widespread use of the secularized mindfulness construct. These may include concepts such as the attainment of enlightenment, and perceiving the true nature of reality (Dimidjian & Linehan, 2003). In the future, researchers may choose to examine the difference between the goals originally outlined in Buddhist mindfulness practice (e.g. impermanence of the self) and the goals of mindfulness in the secularized Western construct of mindfulness (e.g. impermanence of psychological events), which may be influencing entirely different psychological processes (Ostafin et al., 2006).

Wallace and Shapiro (2006) proposed a fourfold model of well-being in an attempt to improve understanding between modern science and Buddhism, and to integrate more traditional
components of Buddhism with the secularized Western operationalization of mindfulness. They suggest that mindfulness may be conceptualized as a component of four broader categories. These categories include *attentional balance*, which involves overcoming attentional deficit to develop the ability to sustain deliberate attention; *cognitive balance*, which involves remaining calm and present with experiences as they arise; *conative balance*, which involves one’s intention and desire; and *affective balance*, which arises as a natural result of attentional, cognitive, and conative balance. Affective balance is thought to facilitate the development of emotion regulation skills (Wallace & Shapiro, 2006).

Mindfulness-Based Psychotherapies in Western Psychology

*Mindfulness-Based Stress-Reduction (MBSR)*

Several of the most frequently researched forms of mindfulness in Western science are based in some part on MBSR, which was developed in the 1970’s by Jon Kabat-Zinn as a method of increasing general mindfulness. In MBSR mindfulness is conceptualized as a method by which the patient can learn to observe their experience from a “detached” perspective (Kabat-Zinn, 1984). MBSR was developed as an adjunct or complementary intervention for a range of physiological and psychological ailments, including mood and anxiety symptoms, chronic pain, cancer, AIDS, heart disease, and hypertension (Kabat-Zinn, 1990). The intervention is rooted in the belief that psychological factors, including the ways in which we think and behave, can have a significant impact on physical health and illness. Participants are trained in various meditation techniques that teach them to be more aware of thoughts and feelings and alter their relationship to them (Bishop, 2002).

The 8-week MBSR program consists of 2-3 hour meetings once per week, and includes a
requirement of daily mindfulness exercises for a period of 45-minutes. Over the course of the program the focus of attention during sitting meditation includes breathing, attention to body sensations, a sense of the body as a whole, and eventually the thought process itself. Additional mindfulness practices included in the program are walking meditation, body scan exercises, basic yoga, and a 1-day meditation retreat towards the end of the program (Kabat-Zinn, 1993). For many MBSR patients, mindfulness practice and other behavioral strategies are utilized in conjunction with traditional medical treatment and medication regimens (Kabat-Zinn et al., 1992).

Nyklicek and Kuijpers (2008) found that MBSR was associated with decreased levels of reported distress, increased quality of life, and positive affect. MBSR treatment with adolescent psychiatric outpatients was also found to be associated with a decrease in reported distress, including anxiety, depression, and somatic complaints (Beigel et al., 2009). MBSR has also been shown to be an effective stress management method for medical students and healthcare professionals, facilitating reductions in psychological distress (Rosenzweig et al., 2003; Shapiro et al., 2005). Despite these encouraging findings, the literature has also revealed significant methodological shortcomings. Better-controlled studies are needed to demonstrate the efficacy of MBSR with a wide range of clinical presentations (Beigel et al., 2009; Bishop, 2002). Further research to replicate previous studies is also warranted before results can be more widely generalized.

Mindfulness-Based Cognitive Therapy (MBCT)

Another mindfulness-based psychotherapy that has received considerable attention from researchers and clinicians is MBCT (Teasdale et al., 2000). This treatment protocol, based
largely on MBSR, is aimed at reducing the rate of relapse in individuals recovering from major depressive symptoms, by teaching them to recognize early signs of depressive relapse and react to them more effectively.

In a randomized trial, Teasdale et al. (2000) found that recovered recurrently depressed clients with three or more episodes of depression who received MBCT in addition to the usual treatment were shown to have half the rate of relapse and recurrence over the follow-up period compared to patients receiving only treatment as usual. Participation in MBCT treatment also results in fewer overgeneralizations of autobiographical memories in individuals recovering from major depressive symptoms (Williams et al., 2000). Teaching participants to focus carefully on regular life events and allowing thoughts to enter awareness without trying to suppress them appears to result in less sweeping statements when retrieving memories.

Teasdale, Segal, and Williams (1995) also suggest that attentional control training may aid in preventing relapse in recovered formerly depressed clients. Attentional control training consists of cognitive therapy and mindfulness training, which are thought to have complementary effects. Whereas the cognitive component addresses the thoughts and behavior associated with depression, mindfulness practice teaches psychological skills and provides the client with practical tools to address future difficulties more effectively after treatment has terminated (Teasdale et al., 1995).

*Dialectical Behavior Therapy (DBT)*

DBT (Linehan et al, 1991) is another mindfulness related therapy that has received considerable attention and empirical support over the past several decades. DBT utilizes mindfulness principles in the treatment of clients with borderline personality disorder (BPD) by
facilitating the development of distress tolerance and emotional regulation, including emotions associated with depression and other maladaptive mood states (Linehan, 1993a).

DBT treatment consists of four modes of therapy. The first is a traditional therapy component where the client meets regularly with the therapist. During sessions the therapist and client collaboratively address life-threatening behaviors, therapy interfering behaviors, and other symptoms associated with axis I disorders (Linehan, 1993a). Because DBT was developed for clients who are highly suicidal, treatment is ultimately aimed at helping clients to survive and build a "life worth living" (Lynch & Trost, et al., 2007). A second component of treatment involves weekly group meetings, which aim to build mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness skills (Linehan, 1993b). DBT takes more of a Zen approach than some other mindfulness-based interventions, by emphasizing the importance of mindfulness in discovering the “middle path” between the extremes that characterize BPD clients (Lynch & Trost, et al., 2007). Distress tolerance skills are taught through a number of exercises aimed at increasing tolerance and by taking an approach of radical acceptance. Emotion regulation can be described as the way that individuals intentionally and unintentionally influence the emotions that they experience, as well as when and how they are experienced (Gross, 1989). It also involves a subjective change in the experiential, behavioral, and physiological response systems (Gross, 1999). The interpersonal effectiveness component of skills training group involves improvement of interpersonal relationships, and teaches the skills necessary to interact more adaptively with others (Lynch & Trost, et al., 2007). The third component of DBT treatment involves telephone contact between client and therapist outside of normal therapy hours. This encourages the client to generalize the skills that they have learned in therapy to their lives in more specific situations (Lynch & Trost, et al., 2007). The fourth and
final component of DBT involves consultation, during which the therapist and skills group leaders are provided with an opportunity to give and receive feedback. This serves several functions including an opportunity to coordinate client care and discuss difficult clients, as well as prevent therapist burnout by discussing their own difficulties (Lynch & Trost, et al., 2007).

Research indicates that DBT substantially reduces self-injuring behavior and depression in individuals with BPD (Linehan et al., 1991, 1993a, 1993b). DBT has also demonstrated significant reductions in medical risk associated with self-injury, and days of psychiatric hospitalization (Linehan, 1991; Linehan et al., 1994). Lynch & Cheavens, et al. (2007) found that DBT treatment in conjunction with medication management was more effective than medication management alone in reducing interpersonal sensitivity and aggression among adults with personality disorders. Telch, Agras, & Linehan (2001) examined the effect of modified, 20-week DBT skills group on women with binge eating disorder. Compared to treatment as usual, the clients receiving DBT skills group treatment demonstrated a significantly decreased number of binge eating episodes over the past month (Telch, Agras, & Linehan, 2001). Several other studies have also looked at the effect of DBT on eating disorders, and have demonstrated promising results (Safer et al. 2001; Telch, Agras, & Linehan, 2000). Safer and colleagues suggested that compared to a control condition, DBT treatment was related to significantly reduced binging and purging episodes (Safer et al., 2001).

Acceptance and Commitment Therapy (ACT)

ACT (Hayes, Strosahl, & Wilson, 1999) is part of what has been called the “third wave” of behavioral therapy (Pull, 2008). ACT includes principles of mindfulness with a specific focus on building acceptance skills, openness to experience and nonjudgmental observation (Hayes,
In contrast to MBSR and MBCT, ACT does not require clients to practice formal sitting meditation, and instead focuses on decreasing “cognitive fusion” and “experiential avoidance” through various de-fusion and acceptance building practices. In ACT clients are asked to identify and define their core values, and are encouraged to pursue behaviors that are more consistent with these values (Hayes, 2002).

Research indicates that ACT may be usefully applied to a range of clinical presentations including substance use, depression, and psychosis (Hayes et al., 2004). In the treatment of severely mentally ill individuals ACT has been shown to reduce the recurrence of hospitalization in those who experienced severe delusions and hallucinations (Bach & Hayes, 2002). Psychotic patients were able to learn to have greater acceptance of distressing symptoms, and to recognize symptoms as possibly inaccurate reflections of reality. ACT has also been shown to improve mixed anxiety and mood symptoms, and may be as effective as the current "gold standard" of cognitive therapy (Forman et al., 2007). Additional studies have demonstrated promising results in the treatment of OCD symptoms, including skin picking, hair pulling and other compulsive behaviors (Twohig, Hayes & Masuda, 2006a; Twohig, Hayes & Masuda, 2006b; Twohig & Woods, 2004). Some have suggested that ACT may better suited for treatment of anxiety than CBT, due to the respective goals of cognitive defusion versus cognitive restructuring (Heimberg & Ritter, 2008). ACT proponents argue that cognitive restructuring may be counterproductive to treatment goals, since the aim is to change the maladaptive cognitions, as opposed to the treatment goal of ACT, which is to defuse the maladaptive relationship to cognitions (Heimberg & Ritter, 2008). Rather than addressing the antecedents to maladaptive thoughts, ACT is comprised of response-focused strategies (Hofmann & Asmundson, 2008).

Meta-analyses suggest that ACT has the potential for significant clinical utility, and has
been found to have superior efficacy compared to control conditions (Powers et al., 2009). However, there is currently no evidence suggesting that ACT is any more effective than other established treatments. Similar to much of the mindfulness research, the limitations of studying ACT include inadequate control groups and small sample sizes (Pull, 2008).

**Mindfulness-Based Relapse Prevention (MBRP)**

In MBRP, mindfulness is used to increase awareness and acceptance of initial substance craving responses without the usual corresponding judgments and maladaptive cognitions or behaviors (Witkiewitz, Marlatt, & Walker, 2005). In MBRP, clients are trained in the specific mindfulness skills of coping, awareness, and enhancing self-efficacy, which are utilized to more effectively identify high-risk situations and early warning signs of relapse. Participants of MBRP programs are asked to monitor and tolerate unpleasant experiences, cognitions, and emotions, without judgment, accepting them as best they can. Due to its relatively infancy and distinction from other mindfulness-based therapies, MBRP still lacks substantial empirical support (Witkiewitz, Marlatt, & Walker, 2005). Although preliminary inquiries have provided promising results in a variety of medical settings, future research should aim to use better control groups and more rigorous methodology (Shigaki, Glass, & Schopp, 2006).

**Additional Applications**

Other promising applications of mindfulness address a range of clinical presentations, including generalized anxiety and panic symptoms (Kabat-Zinn et al., 1992), social phobia (Bogels, Sijbers, & Voncken, 2006), chronic pain (Carson et al., 2005), sleep disturbance (Carlson & Garland, 2005), menopause (Carmody, Crawford, & Churchill, 2006), fibromyalgia
(Kaplan, Goldberg, & Galvin-Nadeau, 1993), binge eating (Kristeller & Hallet, 1999), and psoriasis (Kabat-Zinn et al., 1998). Although mindfulness-based interventions appear to be clinically promising for a range of client presentations, researchers continue to have difficulty demonstrating efficacy (Dimidjian, & Linehan, 2003).

Mindfulness has been shown to be efficacious when included in various treatment packages, although the efficacy of specific mindfulness techniques in isolation is not yet clearly understood (Christopher, 2007). Part of the difficulty lies in the variety of techniques used to teach mindfulness skills to psychotherapy clients. This may be because clinicians tend to emphasize the components of mindfulness that are most appropriate for the specific client presentation (Christopher, 2007). A client with an anxiety disorder for example may benefit from an emphasis on separating thoughts from the self more so than attention regulation.

As noted above, common limitations to much of the mindfulness research includes inadequate control groups and power of treatment effects, and a lack of descriptive training procedures (Dimidjian, & Linehan, 2003). Additional barriers to the progress of research in mindfulness include the precise attempts of researchers to operationally define the practice itself, which may overlook many of the more subtle components that comprise mindfulness (Andresen, 2000). Further investigation is needed to determine which methods of mindfulness training lead to the most effective clinical change with diverse groups of clients.

Mechanisms of Change

Several mechanisms have been suggested for how mindfulness may facilitate symptom reduction and behavior change. A few of the most commonly proposed mechanisms include acceptance, exposure, cognitive, behavioral, and emotional flexibility, and distress tolerance,
each of which are thought to be intertwined in mindfulness training (Shapiro et al., 2006). However, different mindfulness-based therapy interventions tend to emphasize one or more aspects over others, and may place more emphasis on certain change mechanisms in order to target the specific maladaptive processes that the intervention aims to address (Teasdale, Segal, & Williams, 2003). Because the exact mechanisms of mindfulness are not yet understood, a great deal of further research on the topic is warranted.

One area of continued debate in mindfulness research surrounds whether these proposed mechanisms are part of the process of being mindful or rather the outcome. Some have raised the argument that proposed mechanisms such as acceptance and exposure are better conceptualized as outcomes of mindfulness rather than as mechanisms of change (Bishop et al., 2004; Brown & Ryan, 2004). There appears to be a tendency among researchers to use the term mindfulness interchangeably to describe a state, a set of related processes, and a method of practice aimed at achieving the state (Chambers, Gullone, & Allen, 2009). Therefore, as noted above, further consensus on basic operationalization and research into the mechanisms of change seems necessary in order for meaningful advancement to occur in mindfulness research. In the section below, several possible mechanisms of change in mindfulness-based interventions are reviewed.

Acceptance

A key component of mindfulness training entails assuming an open and accepting approach towards life’s experiences, and being fully attentive to each moment as it comes (Kabat-Zinn, 1990). The term acceptance refers to “taking what is offered,” although this should not be confused with resignation, which has negative connotations (Hayes & Strosahl, 2004). Intruding thoughts are viewed as meaningful events to be experienced and appreciated, rather
than distractions to be pushed away (Bishop et al., 2004). Acceptance is conceptualized as a mechanism by which individuals are allowed to experience pain, unpleasant thoughts, emotions, and urges without trying to change or escape them (Kabat-Zinn, 1990). It involves a willingness to embrace the current experience with all of its accompanying cognitions, emotions, and sensations (Hayes & Strosahl, 2004). Based on this model, Bishop and colleagues (2004) speculate that mindfulness training should decrease the likelihood of engaging in strategies to avoid unpleasant aspects of current experience.

Exposure

According to Kabat-Zinn (1982), mindfulness meditation utilizes several mechanisms including exposure to encourage maintaining attention directly on uncomfortable sensations with a nonjudgmental attitude. This is believed to reduce the distress associated with pain, negative cognitions, and emotions. Hayes & Strosahl (2004) suggest that the ACT concept of making contact with the present moment can involve behavioral and cognitive exposure techniques. However, rather than using exposure to directly reduce symptoms or adverse reactions, ACT emphasizes the importance of contacting the present moment willingly, with the aim of building greater psychological flexibility. Exposure to feared objects or situations is not done with the goal of fear extinction, but to increase tolerance of the unpleasant fearful experience (Eifert & Forsyth, 2005). By helping the client to reperceive the contents of their unpleasant experience with greater objectivity and less reactivity, it is believed that they become more willing to engage in direct exposure. Exposure is thought to facilitate increased tolerance of unpleasant experiences, and ultimately to improve ability to view these experiences (including emotions, sensations, and cognitions) as less threatening (Shapiro et al., 2006).
Cognitive, Behavioral, and Emotional Flexibility

Increased cognitive, behavioral and emotional flexibility are thought facilitate change by keep one from overly identifying with their current experience (Shapiro et al., 2006). Increased clarity while observing the present moment experience allows one to respond in a less conditioned and automatic way. Because the human experience involves continuously changing phenomena, greater flexibility inherently allows one to adjust to life experiences in a more adaptive manner.

Kabat-Zinn (1982) also suggests that mindfulness meditation involves cognitive change, or altering thought patterns and attitudes about one’s thoughts, including an understanding that thoughts are “just thoughts” and not necessarily reflections of reality. Strengthening this ability to watch thoughts pass without attachment has been found to decrease the frequency of ruminative thinking (Segal, Williams, & Teasdale, 2002). ACT utilizes cognitive defusion techniques, which include experiential exercises, paradox and mindfulness to change the context of the thought process, thereby decreasing the impact of unpleasant experiences (Hayes & Stosahl, 2004). Cognitive defusion techniques do not aim to alter thought patterns, but rather aim to disrupt dysfunctional verbal processes that are believed to contribute to the maladaptive interpretation of experiences. Identifying and addressing ordinary meaning functions of language is thought to facilitate increased insight of the ongoing process of framing events relationally (Blackledge, 2007).

Additional Proposed Mechanisms

Shapiro et al. (2006) proposed a theory on the primary mechanisms of mindfulness,
which includes three fundamental components or axioms: (a) intention, (b) attention, and (c) attitude (IAA). Each of these components is believed to be interconnected, occurring simultaneously as part of the complex process that we call mindfulness (Shapiro et al., 2006). Shapiro and colleagues argue that these fundamental components of mindfulness account for a great deal of the variance found in the change process that is observed in mindfulness practice (Shapiro et al, 2006).

The axiom of intention refers to the reasons why one engages in mindfulness practice, and is continuously evolving as one advances with deepening practice. Intention may for example involve self-regulation, self-exploration, or self-liberation, dynamically shifting and changing with increasing awareness and insight (Shapiro et al., 2006). Attention is described as another axiom, and involves awareness of the present moment experience and attending fully to this experience. Attitude, or the qualities that an individual brings to the practice of paying attention, is also believed to be of utmost importance (Shapiro et al., 2006). Approaching the practice with a negative attitude is associated with decreased energy and commitment and can be detrimental to the cultivation of mindful awareness. Additionally, the attitude that one brings to mindfulness practice is believed to have a significant influence on the long-term value of the practice for an individual (Kabat-Zinn, 1990), although this theory has been largely unexplored empirically.

Jain et al. (2007) suggested that rumination appears to be a crucial mediator in mindfulness outcomes, particularly among experienced meditators. Reduced rumination may be unique to mindfulness practice and separate from the effects of relaxation. Although relaxation and mindfulness training have been found to have a similar effect on the reduction of distress, mindfulness training appears to have a greater impact on improving mood states (Jain et al.,
Rumination is often described as excessive attentional focus on dissatisfying or unhappy emotions. However, the core components of rumination appear to be related less to sustained attention on unhappiness, but rather to attention that is perceived to be uncontrollable and is accompanied by criticisms, self-judgment, and unwillingness to experience the unhappy cognitive state (Rude, Maestas, & Neff, 2007). Mindfulness practice is thought to progressively separate attention to distressing events from the evaluative judgments that often go unrecognized (Brown & Ryan, 2003).

**Distress Tolerance**

*Definition and Operationalization*

Simons and Gaher (2005) defined distress tolerance as one’s capacity to experience and withstand negative psychological states. It has also been defined as the ability to persist in goal directed behavior while experiencing psychological distress (Daughters et al., 2008). Considered a meta-emotion, distress tolerance involves subjective perception and evaluation of negative stimuli as it relates to four proposed components: tolerability and aversiveness, appraisal, absorption of attention, and emotion regulation (Simons & Gaher, 2005). Distress tolerance has been shown to be negatively associated with measures of affect dysregulation and positively associated with measures of positive affectivity (Simons & Gaher, 2005).

Individuals with low distress tolerance describe emotional discomfort as unbearable, unacceptable, and often behave in ways to reduce the discomfort experienced. This may involve making significant efforts to avoid unpleasant stimuli (Simons & Gaher, 2005). The appraisal of an individual with low distress tolerance might reflect an unwillingness to accept the present
experience, and may involve judgmental thoughts or evaluative self-statements. The ability to tolerate distress may influence the types of strategies used for affect management, as well as the impact of affect on behavior (Simons & Gaher, 2005). In extreme cases of distress intolerance, individuals may even harm themselves or others as a method of coping or regulating emotion during times of increased distress (Daughters et al., 2008). Linehan (1993a) suggested that a lack of distress tolerance is a significant contributor to maladaptive, impulsive and destructive behavior in individuals with BPD. Antisocial personality disorder (ASPD), which is often described as having common etiological factors with BPD, has also been shown to be associated with significantly lower levels of distress tolerance (Daughters et al., 2008).

In addition to affecting emotional regulation styles, distress tolerance is believed to influence acceptance of distress as an unavoidable part of life, and contributes to individual differences in the appraisal of distress (Simons & Gaher, 2005). Individuals with low distress tolerance have greater difficulty focusing on things other than their current distress. Men have endorsed higher levels of distress tolerance than women, and this difference appears to be significant even after accounting for negative affectivity, although this may be related to the higher rates of reported alcohol consumption as a coping strategy among men relative to women (Simons & Gaher, 2005).

**Distress Tolerance Scale (DTS)**

In an attempt to measure psychological distress tolerance, Simons and Gaher (2005) developed the Distress Tolerance Scale (DTS), which consists of 15 items rated on a 5-point Likert-type scale. Questionnaire items ask respondents to rate their subjective perception of ability to regulate emotions, accept distressing emotions, and function effectively despite
experiencing psychological distress (Simons & Gaher, 2005). In addition to the general factor of psychological distress tolerance, a factor analysis revealed four first-order factors: Tolerance, Appraisal, Absorption, and Regulation. Although the DTS demonstrates good psychometric properties including high internal consistency (Cronbach’s $\alpha = .89$) and test-retest reliability ($r = .61$; Simons & Gaher, 2005), further confirmatory and exploratory factor analysis may be needed to firmly establish the validity of the DTS for various clinical applications. No known studies to date have performed subsequent factor analysis on the DTS.

Another measure of distress tolerance, also called the Distress Tolerance Scale (DTS-2), was developed by Corstorphine et al. (2007) to specifically measure difficulties in regulating emotional states in individuals with eating disorders. The 20-item questionnaire assesses tolerance for pleasant and unpleasant affective states, with each item rated on a 5-point Likert-type scale. The DTS-2 initially demonstrated good psychometric properties. Factor analysis suggested 3 main factors: (a) avoidance of affect, (b) accepting and managing, and (c) anticipate and distract (Corstorphine et al., 2007). However, subsequent confirmatory and exploratory factor analysis by Raykos et al. (2009) suggests limited replicability with a clinical sample of eating disorder patients. They suggest that rather than the three-factor model proposed by Corstorphine et al., a four-factor model provides a better fit with the clinical sample used. The four factors were labeled (a) anticipating and managing affect, (b) anticipating and managing loneliness, (c) cognitive avoidance of affect, and (d) behavioral avoidance of positive affect (Raykos et al., 2009). Raykos and colleagues suggest using caution when interpreting the DTS-2 with eating disordered clients and emphasized the need for further research to identify the most valid and reliable measures of distress tolerance in eating disorders.
The Empirical Study of Distress Tolerance

Much of the research examining psychological distress and distress tolerance has focused on alcohol, tobacco, and other substance abuse as coping strategies (Brown et al., 2002; Zvolensky et al., 2009). Distress tolerance is negatively associated with substance abuse as a coping strategy (Simons & Gaher, 2005). An individual with low distress tolerance may be more likely to use substances to cope with negative emotional states (Zvolensky et al., 2009), and may be at an increased risk for relapse following recovery (Brown et al., 2002). It has been suggested that distress tolerance may be a significant predictor of tobacco smoking cessation. Individuals with a low level of distress tolerance may be more likely to lapse upon attempting to quit (Abrantes et al., 2008).

Brown et al. (2002) examined distress tolerance in individuals attempting to quit smoking, by asking participants to endure physically and psychologically stressful tasks. Results demonstrated that individuals who had never attempted to quit previously (immediate relapsers) were significantly less willing to endure the unpleasant tasks than smokers who had previously attempted to quit smoking (delayed relapsers). Interestingly, self reported reactions between the two groups did not differ significantly, although the immediate relapsers reported more commonly reacting with stress to negative affect at baseline (Brown et al., 2002). The higher tendency to focus on negative affect and urge to escape among immediate relapsers is consistent with the tendency to lapse early when faced with tasks that involve experiencing unpleasant or uncomfortable stimuli (Brown et al., 2002).

Zvolensky (2008) attempted to examine changes in distress tolerance among individuals with high anxiety sensitivity that were attempting to quit smoking by applying a treatment consisting of acceptance-based behavioral strategies, cognitive restructuring, and interoceptive
exposure. Results demonstrated clinically significant increases in distress tolerance as well as other significant gains in smoking outcome (Zvolensky et al., 2008).

O’Cleirigh and Ironson (2007) reported that among patients with HIV, lower distress tolerance is associated with more HIV-related symptoms over the past month. This included measures of depressive symptoms, substance use coping, alcohol and cocaine use, and number of reasons reported for missing medication doses. They further suggest that distress tolerance is a fundamental process that may affect the advancement rate of disease symptoms over time (O’Cleirigh & Ironson, 2007).

It has also been suggested that deficits in distress tolerance may play a significant role in dysregulated eating disorders (Anestis et al., 2007). Anestis and colleagues evaluated the relationship between distress tolerance, urgency, and the development and maintenance of bulimic symptoms. Individuals with low distress tolerance and a high sense of perceived urgency were found to be at an increased risk for the development of bulimic symptoms. Additionally, distress tolerance and urgency were shown to significantly predict bulimic symptoms even when accounting for numerous covariates including depressive and anxious symptoms, anxiety sensitivity, gender, and negative affect (Anestis et al., 2007). These findings support the suggestion that low distress tolerance is related to increases in a wide range of maladaptive and self-destructive behaviors, and that distress tolerance may play a significant role in the development and maintenance of bulimia.

Mindfulness & Distress Tolerance

According to Buddhist teachings, the root of all human suffering is related to desire. In other words, a disequilibrium between one’s actual experience and the experience that one would
like to have is believed to cause and maintain suffering (Germer, Siegel, & Fulton, 2005).
Attempts to control aspects of emotional and cognitive experiences that are beyond one’s control
tend to lead to an increase in levels of psychological distress. Mindfulness practice is thought to
increase one’s willingness to endure and tolerate these unpleasant or uncomfortable experiences
without attempting to change them (Eifert & Heffner, 2003). However, very few studies to date
have directly examined the relationship between mindfulness and distress tolerance.

The Buddhist perspective on mindfulness states that psychological distress and mental
agitation is to be investigated through Vipassana, meaning to look into one’s current experience,
including unpleasant experiences, and see its true nature (Sumedho, 2002). According to
Buddhist teachings, suffering and distress are addressed by keeping in mind that these are merely
impermanent conditions of the mind and nothing more (Chah, 2004). Just as happiness is merely
happiness and pleasure is merely pleasure, suffering too is merely suffering. By maintaining this
perspective, perceptions are believed to gradually change, as do feelings about things that may
have previously been quite distressing.

The firmly held attachment to things, feelings, or thoughts in relation to the self is also
thought to perpetuate unnecessary suffering (Chah, 2004). Buddhist mindfulness training
emphasizes the teaching of anatta or selflessness when being present with experiences,
understanding that whatever arises simply passes away and does not define the self (Sumedho,
2002). In this way, one can be a witness to their distressing experience in an effort to better
understand it, rather than trying to suppress or neglect the experience. When one can recognize
the nature of the human predicament and learn from it, the mind becomes increasingly receptive
to, and accepting of the unpleasant experiences that are often repressed in consciousness
(Sumedho, 2002).
Another mechanism responsible for increased distress tolerance from the Buddhist perspective involves the law of kamma. Kamma refers to an acceptance and understanding of all human existence as involving inevitable suffering in various forms such as pain, sickness, anxiety, and so forth. Ultimately, it is an understanding that all which begins must eventually come to an end (Sumedho, 2002). Suffering and distress is exacerbated by the sense of attachment to control over life experiences, especially, those that are beyond control. Attempts to struggle, resist, and manipulate our experiences lead to frustration and feeling frightened or depressed (Sumedho, 2002). When one is able to detach from the thoughts about sensory experiences as “me” or “mine,” we can experience these conditions as they truly are. One is able to more patiently and acceptingly tolerate unpleasant experiences, and adapt to change, whether the change is perceived to be pleasant or unpleasant (Sumedho, 2002).

Ostafin et al. (2006) empirically examined an intensive 10-day Vipassana meditation course, and found that initial measures of distress were reduced following the retreat, although a higher frequency of meditation following the retreat was not associated with greater reductions in distress. Ostafin and colleagues addressed the criticism that much of the research on mindfulness has utilized a secularized operationalization, by empirically evaluating an alternative method of teaching mindfulness. They suggest that mindfulness-based interventions may benefit from re-introducing mindfulness in its original Buddhist context (Ostafin et al., 2006). The study demonstrates that intensive Buddhist Vipassana meditation retreats may have a significant effect on psychological distress.

In an attempt to better understand the mechanisms of action, Arch and Craske (2006) examined the effect of a mindfulness-based breathing induction on the level of willingness to view highly aversive pictures. Compared to unfocused attention, the focused breathing group
was shown to have a lower level of self-reported negative affect as well as increased willingness to view and tolerate more very negative slides. This suggests that a very basic mindfulness exercise may facilitate a more adaptive way of responding to negative stimuli (Arch & Craske, 2006). This finding was especially interesting given that the focused breathing group had no previous experience with mindfulness or meditation. The study was limited, however, by a failure to compare mindfulness-based focused breathing with a simple relaxation breathing exercise in order to determine if the effects of mindful breathing impact willingness to tolerate negative stimuli any more than relaxation (Arch & Craske, 2006).

**Distress Tolerance in Mindfulness-Based Treatments**

Despite the growing evidence that supports the relationship between mindfulness and distress tolerance, very little research has been conducted examining this relationship directly since the development of the distress tolerance scale by Simons and Gaher (2005). Mindfulness researchers currently raise the question of whether mindfulness is directly responsible for reduced psychological distress independent of its influence on other mechanisms, or whether mindfulness indirectly influences psychological distress through its effect on other mechanisms (Coffey & Hartman, 2008). Although it is possible that mindfulness does not directly reduce distress in an unpleasant situation, a nonjudgmental, accepting, and decentered approach may facilitate a more adaptive response and greater understanding of the larger context of the situation (Roemer & Orsillo, 2003), which may include greater distress tolerance. Indeed, it seems that mindfulness practice may increase one’s ability to perceive emotional distress as less threatening (Bishop et al., 2004) thereby increasing tolerance of distressing experiences.

Some mindfulness-based treatments have emphasized the importance of distress
tolerance in facilitating positive treatment outcome. DBT for example, specifically targets the extreme intolerance for distress commonly seen in clients with BPD. A central component of treatment focuses on building distress tolerance skills to better identify distressing emotional states and improve ability to cope with them (Linehan, 1993b). Interestingly, although increasing distress tolerance is a central objective of DBT, there are few measures currently available which accurately assess this construct (Simons & Gaher, 2005).

Twohig, Hayes, and Masuda (2006a) examined the effectiveness of an 8-week ACT intervention for OCD. Results were not only consistent with the hypothesis that the intervention would lead to increased willingness to experience obsessions, but also included a decrease in OCD symptoms. This included significant reductions in compulsive behavior, experiential avoidance, believability of obsessions, and the need to respond to obsessions (Twohig et al., 2006a). The authors suggest that ACT helps the individual experience an obsession as simply a thought, while continuing to take action in a valued direction.

Other research on distress tolerance has looked at medical patients presenting with chronic pain (Kabat-Zinn, 1984). In an uncontrolled study, Kabat-Zinn looked at the effect of the mindfulness-based stress reduction and relaxation program on the self-regulation of chronic pain patients. Results suggested that the 10-week treatment program was related to a significant decrease in severity and frequency of pain. Kabat-Zinn suggests that mindfulness practice facilitates this shift by cultivating a detached observational approach to one’s experiences, in effect “uncoupling” the sensory pain experience from the evaluative emotional reaction that often accompanies it (Kabat-Zinn, 1984).

Chadwick et al. (2009) explored the effect of mindfulness training on psychotic individuals experiencing distressing voices and paranoia. The intervention emphasized learning
to let go of futile attempts to fight intrusive voices and paranoid rumination, as well as observation and acceptance of the distressing experience. In addition to increasing awareness of psychotic symptoms, the intervention aimed to increase understanding of habitual coping reactions and their maladaptive effects. Mindfulness training was associated with significantly improved clinical functioning and increased mindfulness of distressing thoughts and images (Chadwick et al. (2009). Abba, Chadwick, and Stevenson (2008) suggest that mindfulness training facilitates an increased tolerance of distressing psychotic experiences by allowing them into awareness without judging the experience or attempting to change it.

Mindfulness practice may facilitate increases in distress tolerance and promote a particular way of relating to all experience that can lessen individual suffering by redirecting focused attention, rather than attempting to control unpleasant negative emotions (Seigel, Germer, & Olendzki, 2008). This includes countering the mind’s natural tendency to turn away from unpleasant stimuli (Olendzki, 2008). Surrendering to what is happening in the present moment without attempting to alter the immediate experience is believed to cultivate an improved ability to tolerate a full range of emotional, cognitive, and physical experiences without trying to suppress unpleasant experiences (Kornfield, 1993). This is thought to foster an increased recognition that individuals are not defined by their thoughts, emotions, and sensations (Hayes & Wilson, 1994).

Conclusions and Directions for Future Research

Although many individuals may enter treatment with the hope that mindfulness practice will rid them of negative emotions, they may be surprised to learn that the goal of mindfulness is not to rid the mind of unpleasant experiences, but in fact the opposite, to experience a range of
present moment experiences even more directly (Siegel et al., 2008). Nevertheless, many mindfulness researchers have demonstrated meaningful reductions in psychological distress as facilitated by a number of mechanisms. It is these mechanisms that may warrant the most future attention due to the ongoing lack on consensus regarding a standard operationalization of mindfulness. It seems that although the observed reductions in psychological distress may not be the “purpose” of treatment, it may be an indirect result of training the mind to relate more adaptively to the mental events that it experiences. Initial steps toward a better understanding may include experimental research to distinguish between the measures of mindfulness, and its resulting qualities.

As preliminary research has suggested, mindfulness practice may indeed facilitate increased distress tolerance (Eifert & Heffner, 2003; Twohig, Hayes and Masuda, 2006a). Although a great deal of further research on the subject is warranted, the question of how exactly mindfulness facilitates this change remains a significant challenge to researchers. Does mindfulness facilitate self-regulation by improving ability to choose willed goals over impulses, or rather through a direct effect on unpleasant affective states (Taylor & Mireault, 2008)? Which of the proposed mechanisms of change are the most instrumental in the shift to increased self-regulation and distress tolerance? These are important questions that have yet to be answered, and will likely be at the forefront of mindfulness research for many years to come.

Although a few researchers have begun to examine the relationship between mindfulness and distress tolerance more directly, it may be helpful to make the distinction between the separate effects of mindfulness on distress reduction and distress tolerance. Researchers must clarify not only how mindfulness training reduces the degree of psychological distress experienced, but also how it may increase one’s ability to tolerate unpleasant or distressing
experiences. Mindfulness likely cannot eliminate distress in all situations, even amongst the most skilled and experienced mindfulness practitioners. It seems more likely that experienced meditators still experience some degree of distress under trying circumstances (although it may be less than a non-meditator). So how exactly do experienced meditators tolerate the distress that they will inevitably experience, and how might this differ from an inexperienced meditator? This is yet another question to be explored in the future research.

It is also of utmost importance for mindfulness researchers to arrive at a more general consensus on the operationalization of mindfulness before claims can confidently be made regarding its impact on distress tolerance in clinical populations. The lack of agreement amongst researchers regarding the often overlapping and inextricably intertwined facets of mindfulness continues to be a significant barrier to the advancement of mindfulness research. Nevertheless, an increased interest in randomized controlled trials over the last decade is encouraging, and suggests that researchers are headed in a promising direction.


