

# The case for mindfulness interventions for traumatic stress in high violence, low resource settings

**Kanthamoney Pillay & Gillian Eagle**

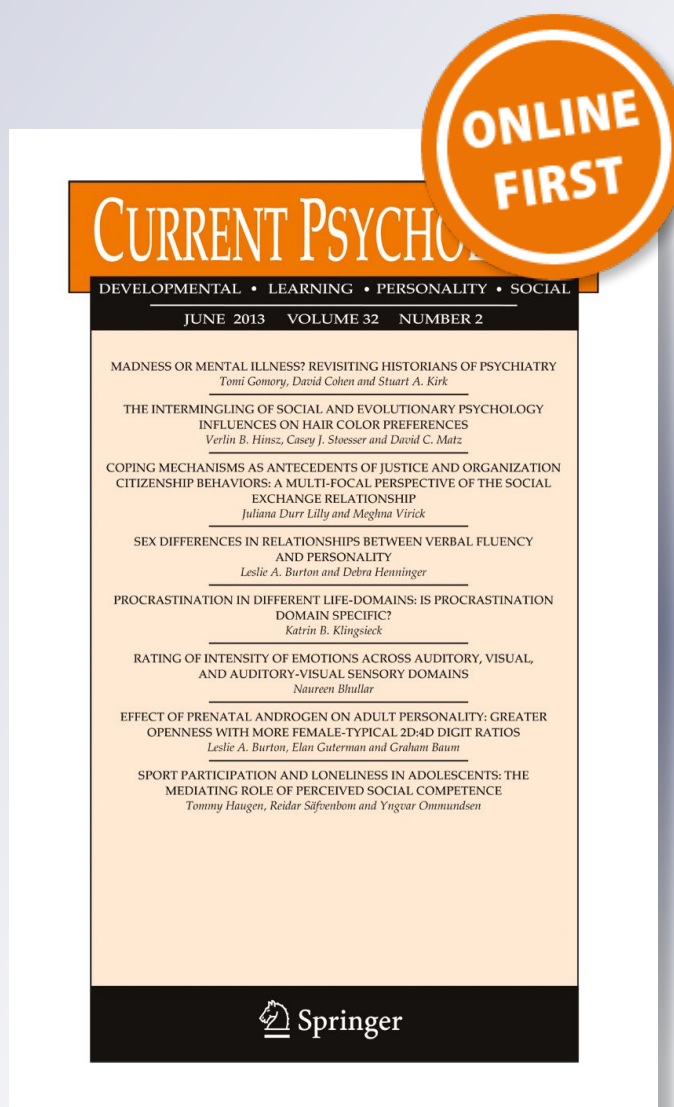
## Current Psychology

A Journal for Diverse Perspectives on  
Diverse Psychological Issues

ISSN 1046-1310

Curr Psychol

DOI 10.1007/s12144-019-00177-1



**Your article is protected by copyright and all rights are held exclusively by Springer Science+Business Media, LLC, part of Springer Nature. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at [link.springer.com](http://link.springer.com)".**



# The case for mindfulness interventions for traumatic stress in high violence, low resource settings

Kanthamoney Pillay<sup>1</sup> · Gillian Eagle<sup>1</sup>

© Springer Science+Business Media, LLC, part of Springer Nature 2019

## Abstract

Academic research on mindfulness has grown exponentially over the last few decades. Despite initial skepticism from some Western sources, the evidence base suggests that mindfulness training (MT) may impact positively on physical and psychological health in both clinical and non-clinical contexts. This paper explores the contention that MT may offer an evidenced-based, comprehensive, contextually relevant, and holistic approach to addressing the individually intensive and socially extensive impact of psychological trauma in South Africa and other similar settings characterized by high levels of violence and limited professional intervention resources. Three inter-related issues are explored in support of this proposal: firstly, evidence that mechanisms of trauma impact and mindfulness benefit are closely inter-related; secondly, the fact that mindfulness can produce both immediate therapeutic and long term prophylactic gain and may therefore be of benefit not only for past traumatization but also in contexts of continuous traumatic stress; and thirdly, the contention that MT may be an appropriate community based intervention in mental health resource constrained contexts.

**Keywords** Mindfulness · Traumatic stress · Continuous traumatic stress · Mindfulness training · Community-based intervention

For many decades Eastern meditation practices have been stigmatized, regarded with suspicion and associated with fraudulent mysticism within Western scientific practice (Kabat-Zinn 1990). Westernized psychology has historically eschewed Eastern meditation practices, however the status of Buddhist meditation practice in the form of MT has shifted radically within the last two decades. Secularized meditation training such as mindfulness-based stress reduction (MBSR) is currently being embraced for self-development and healing. Additionally, Mindfulness Training (MT) practices have also been incorporated into broader clinical treatment approaches such as, mindfulness-based cognitive therapy (MBCT), acceptance and commitment therapy (ACT), and Dialectical Behavior Therapy (DBT) (Didonna 2009). Internationally, MT practices have also found their way into mainstream culture with meditation practices being introduced into non-

clinical settings such as schools, police services, government departments, prisons and the military (Cullen 2011). Within this paper we seek to extend an appreciation of the potential applicability of MT for mental health difficulties with a particular focus on traumatic stress. Although there is a burgeoning body of research seeking to demonstrate the merits of mindfulness for a variety of traumatized populations, we make a conceptual argument that MT may be particularly useful in contexts of high and ongoing violence exposure and in contexts within which there are limited mental health intervention resources. In this instance we take South Africa as our focus but would suggest that the arguments put forward have relevance for many countries in which populations are consistently exposed to high levels of violence and in which intervention resources to deal with traumatization are severely limited. For example, this might apply to the large numbers of displaced people living in refugee camps around the world or to those living in countries affected by civil wars or conflicts.

✉ Kanthamoney Pillay  
kanthapsych@gmail.com

Gillian Eagle  
Gillian.Eagle@wits.ac.za

<sup>1</sup> Psychology Department, University of Witwatersrand, Johannesburg, South Africa

## What Is Encapsulated by the Term Mindfulness?

Mindfulness, a form of insight-oriented meditation practice, was extracted from its Buddhist roots, secularized for Western

consumption, and transplanted into the field of psychology in the late 1970s. Meditation is an umbrella term for various forms of healing and self-growth practices in Buddhism and in Western literature, the term “mindfulness” is often used interchangeable with “meditation”. The literature generally refers to two basic types of meditation practice, concentrative meditation where attention is held on a single object, and insight/mindfulness meditation where attention is expanded to awareness of various objects within and external to the meditator (Smith 1975). Mindfulness is a complex concept to distinguish and define and it remains challenging to comprehensively convey in words what is an essentially phenomenological experience. Kabat-Zinn’s (1994, p.145) frequently quoted definition of mindfulness captures the essential distinguishing dimensions of this construct as a specific form of meditation: “the awareness that emerges through paying attention, on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment”. Training designed to cultivate mindfulness, or MT, involves intentionally focusing attention on objects such as breath, bodily sensations, sensory perceptions, cognitions, and emotions, while maintaining a curious, accepting and non-judgmental attitude (Bishop et al. 2004; Shapiro et al. 2006). Practice may be formal where time is set aside specifically to develop the skill, or informal, where MT is incorporated into aspects of everyday life such as walking and washing dishes. In Western psychology “mindfulness” has been used variously to describe a psychological state of awareness, a practice that promotes this awareness, a mode of processing information, and a personality trait (Davis and Hayes 2011).

A useful way to distinguish MT from other forms of meditation training that may involve concentrated focus on a single object is provided by Olendzki (2009), who likens MT to a floodlight as opposed to a spotlight. MT involves initially attending intentionally to a chosen object and sustaining attention over time. However, subsequently MT encourages practitioners to open attention to a broader range of phenomena such as inner body sensations like the heartbeat, as well as to sensations arising from outside the body (smell, sound etc.). “Like a floodlight rather than a spotlight, mindfulness illuminates a more fluid phenomenological field of ever-changing experience rather than isolating a particular object for intensive scrutiny” (Olendzki 2009, p.42).

Langer and Moldoveanu (2000) describe mindfulness as being alert to the present moment, to distinctions, context, a multiplicity of perspectives and novelty, highlighting the expansion of consciousness that is entailed in MT. Focused observation on the contents of the mind is believed to help develop the set of skills that Siegal (2010) calls “Mindsight”, the term he uses to refer to the learned ability to “see” the mind, and over time to develop the ability to regulate the flow of the contents of the mind. The term “Mindsight” succinctly captures the essence of the skill set

that MT is believed to advance with repeated practice. MT is seen to result in the awareness and acceptance of what is currently being experienced, the promotion of self-regulation, mental flexibility, integrated mental functioning, and compassion for self and others. The development of these skills may be salient in recovery from trauma as well as in the development of resilience in relation to exposure to current and future traumatic stressors.

One reason for the explosion of interest in mindfulness in clinical and research contexts is the large and growing evidence base for the effectiveness of MT, especially from neurobiological and cognitive-behavioral perspectives. Walsh and Shapiro (2006) report that meditation (and by implication mindfulness practices) has become one of the most widely studied psychotherapeutic interventions. The growing popularity of mindfulness is linked to the fact that science is catching up with practice as Eastern contemplative practices are being validated by scientific research in a range of domains, in part because of improved neuropsychological research instrumentation (Siegal 2009). A strong evidence base shows that MT is an effective treatment for various psychological problems, including anxiety, depression, and stress (Houry et al. 2013). The accumulating research validation on the efficacy of MT suggests that it may be a valuable intervention to consider integrating into psychological trauma treatment approaches as has already been suggested.

## Mindfulness in South Africa

Mindfulness does not appear to have had a notable impact on South African psychology until recently but is gaining increasing popularity in this context as evidenced, for example, in the increasing numbers of courses being offered in this modality. In 2014 one of South Africa’s leading private medical aid service providers, Discovery Health, invited Harvard University academic, Dr. Ellen Langer, to present a keynote lecture for their annual conference; promoting her talk with the headline “Mind over matter – how mindfulness can fix, virtually, everything” (Discovery Health 2014). Discovery Health’s invitation to Langer is indicative of the fact that MT is becoming increasingly accepted within the professional health community. However, the promotional headline also highlights a shadow aspect of mindfulness where extravagant claims about impact are advanced within popular culture and the press. Together with the secularization of mindfulness (separating it from its Buddhist philosophical roots), unsubstantiated claims about efficacy and growing commercialization have contributed to criticism of deployment of mindfulness practices in “Western contexts”, or skepticism about what has been termed the “McMindfulness” movement (Purser and Loy 2013). Additional criticisms on the current state of mindfulness practice have been raised in the literature,



including concerns about ambiguous definitions of mindfulness and the employment of dubious methodologies in research claiming to verify mindfulness interventions (Van Dam et al. 2018). While a detailed examination of the critiques of mindfulness is tangential to the focus of this specific paper, it is acknowledged that any promotion of mindfulness interventions needs to remain circumspect regarding the kinds of claims that are put forward and wary of the potential for alignment with exploitative practices.

There is a substantial and growing international body of research that demonstrates the effectiveness of MT in improving psychological and physical health. Based on this available research, as well as the confluence between cognitive-behavioral and neuropsychological theories on the mechanisms of trauma impact and how mindfulness is understood to work to produce benefit, it may be argued that mindfulness is a potentially useful intervention to address trauma exposure in South Africa (SA) and related Low to Middle Income countries (LMIC's), both by reducing negative trauma impacts and by building psychological resilience. Within this article we aim to address three interlinked issues related to the potential deployment of mindfulness in such contexts. Firstly, we wish to present evidence suggesting that MT may be a particularly helpful intervention in addressing the psychological sequelae of trauma exposure. Secondly, we will argue that beyond its efficacy in addressing traumatic stress conditions such as posttraumatic stress disorder (PTSD), mindfulness may be particularly beneficial as an intervention in high violence contexts in which there is poly-victimization and trauma exposure is ongoing. Thirdly, we hope to demonstrate that MT may be useful in low resource contexts in which relatively brief-term, holistic mental health interventions, potentially deliverable by auxiliary mental health workers, are desirable. In keeping with a set of community intervention principles outlined by Kazdin (2014) we argue that it may be helpful to integrate MT as a form of community responsive intervention in relation to both single event and ongoing trauma exposure, thus perhaps reclaiming some of the egalitarian and compassion enhancing aspects of mindfulness as a way of being and set of related practices.

## Trauma in South Africa

High rates of criminal, intimate partner and sexual violence, and of motor vehicle accidents (amongst other features), in conjunction with a noteworthy history of political violence, means that SA represents a context that could be viewed as a “natural laboratory in which to study the impact of traumatic events and their consequences” (Kaminer and Eagle 2010, p.4). Exposure to psychological trauma, either first-hand or vicariously, appears to be the norm rather than the exception for the average South African. Statistics from a 2007 study on a nationally representative sample of adult South Africans

highlight that almost 75% had experienced at least one traumatic event in their lifetime and that many individuals had experienced multiple traumatic events (Williams et al. 2007). While over 50% of responders had experienced more than one traumatic event, some individuals had experienced as many as six or seven such events, with those with higher levels of exposure in the form of poly-victimization demonstrating greater vulnerability to developing mental health conditions (Williams et al. 2007). Researchers writing on the current state of traumatic stress in SA cite concerns about collective and pervasive forms of violence in addition to single incident, individually perpetrated crime, and argue that the formulation of traumatic stress exposure as *continuous* as opposed to *post* may be more apt for both indirect and direct victims in pervasively conflictual contexts (Eagle and Kaminer 2013; Stevens et al. 2013). While people living in high violence contexts on an ongoing basis may well present with some features of PTSD it is often the case that their preoccupation is with current and future threats as opposed to with events that have already taken place.

The construct of Continuous Traumatic Stress (CTS) (Eagle and Kaminer 2013), similar to that of Ongoing Traumatic Stress Reaction (OTSR) (Nuttman-Shwartz and Shoal-Zuckerman 2016), has been proposed as a formulation designed to capture the psychological and contextual features associated with living under conditions requiring realistic appreciation of current and future life threat to self and members of one's immediate community. As proposed by Eagle and Kaminer (2013) one of the cardinal features of CTS is that not only is the individual faced with ongoing threat of traumatic magnitude, but that such circumstances are inescapable. This is usually because people are too impoverished to relocate or because social and political circumstances are such that mobility is severely constrained. In situations of war or civil conflicts, such as in Israel and Palestine with air missile exchanges, or Syria in which drone strikes are a constant source of danger, or in northern parts of Nigeria in which Boko Haram insurgents can destroy entire villages, citizens may have to accustom themselves to living with daily risk that is inescapable. In SA it is argued that many political refugees are exposed to similar risks of danger, as are people living in very high violence, crime-ridden communities in which antisocial forces such as gangs operate almost unchecked (Eagle and Kaminer 2013). A further feature of CTS contexts is the absence of social protections, with government forces often incapacitated or impotent to protect citizens from threat, or in some instances complicit or implicated in violence perpetration (Eagle and Kaminer 2013). While research into CTS and OTSR is ongoing, there is some evidence to suggest that people living under such conditions may present with particular response patterns that are not entirely consistent with PTSD. For example, being hyper alert appears to be common, and given that this characteristic may be functional to a degree, it is difficult to determine at which point this presentation should

be considered symptomatic. It is also evident that avoidant symptoms appear to take prominence over intrusion related symptoms, given the preoccupation with potential threats rather than primarily on past events (Somer and Ataria 2015). In addition, somatization and depressed mood also appear to be present as a consequence of the chronicity of exposure (Somer and Ataria 2015). It is thus argued that intervention approaches may need to be modified in such contexts. While PTSD is recognized to be a clearly pathological or syndromatic response to extreme threat, there is debate as to whether CTS and OSTR can be considered pathological or whether they may rather describe a set of responses that are context-dependent, even if they are highly distressing to individuals (Eagle and Kaminer 2013). This tends to be borne out by research suggesting that mental health difficulties associated with living with extreme environmental threats may remit when people are able to relocate from such environments (Diamond et al. 2010). Nevertheless it is important to consider mechanisms for ameliorating psychological distress associated with living in such dangerous conditions and the possible consequences this has for both compromised mental and physical health.

The literature on trauma in SA suggests that traumatic stress related conditions emerge as a broad-based societal problem with corresponding inter-personal, economic and political impacts. It therefore appears that developing interventions that are supported by research, flexible in implementation and appropriate for contexts of single, multiple and continuous traumatization, would be very beneficial in this and related global contexts. We suggest that MT is a particularly appropriate form of intervention in such high violence, low mental health resource contexts.

### Theorization of Traumatic Stress Impact and Mechanisms of Mindfulness Intervention

Traumatic stress may be viewed as being situated on a continuum of severity with the most extreme form being the clinically diagnosable condition of Posttraumatic Stress Disorder (PTSD). Within the Fifth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association 2013) PTSD is described as characterized by five clusters of symptoms: re-experiencing, avoidance, negative cognitions, negative mood, and arousal. While not everyone who experiences a traumatic event will go on to develop PTSD, it is clear from the DSM-5 description of symptoms and their impact that traumatic stress has a debilitating impact on an individual's well-being, and inter-personal and social functioning. As will be suggested in this article, MT may potentially impact positively on the full spectrum of traumatic stress symptoms and psychological effects.

Neuropsychological and cognitive-behavioral theories of trauma offer theories of traumatic stress impact that are

currently most strongly supported by empirical evidence (Follette et al. 2006). It is noteworthy that most of the evidence base for the impact of mindfulness on various conditions also arises from the schools of neuroscience and cognitive-behavioral psychology.

### Neurobiological Mechanisms of Traumatic Stress Impact and Mindfulness

There is consensus in the neuropsychology literature that traumatic stress symptoms reflect a disruption in self-regulation concomitant with dysfunction in the "normal" stress survival response, whereby the brain engages and then becomes held in the mode of threat, anticipating the need for continuing self-protective responses. The stress response is regulated by the hypothalamic pituitary-adrenal (HPA) axis and the autonomic nervous system (ANS) of the brain (Rothschild 2000). When a threat is encountered, the amygdala sends signals to the hypothalamus to activate the sympathetic nervous system (SNS), which results in the release of epinephrine and norepinephrine by the adrenal glands in preparation for the fight, flight or freeze response (Rothschild 2000). This SNS activation results in physical symptoms such as increased heart rate, respiration and blood pressure, dilated pupils and decrease in digestion, all of which are understood to have evolutionarily significant protective functions against threat (Scaer 2001). When the perception of threat has passed, the hypothalamus sends signals to the pituitary gland which releases cortisol to stop the alarm reaction and the body is restored to homeostasis (Rothschild 2000; Scaer 2001).

In certain conditions, the brain threat detection systems may become dysfunctional. Chronic dysregulation of these systems may lead to functional impairment and neurobiological abnormalities that are reflected in the presentation of PTSD (Sherin and Nemeroff 2011). Brain imaging studies investigating trauma related responses reveal neural circuit disruptions in brain areas responsible for mediating stress and fear responses, such as in the amygdala, hippocampus, anterior cingulate, insula, and orbitofrontal regions (Rothschild 2000).

Impairment of neural circuitry results in the brainstem and limbic system "hijacking" the functions of the pre-frontal cortex (PFC). The over-reaction of the amygdala, known to be critical in fear conditioning and threat detection (Roberts-Wolfe et al. 2012) and impairment of the self-regulatory functions of the pre-frontal cortex, may be linked to the functional impairments observed in trauma responses and symptoms, such as those of avoidance, hyperarousal, intrusion, and impaired emotion modulation. Shin et al. (2006) confirmed that increases in amygdala reaction are linked to more severe PTSD symptoms while increases in prefrontal cortex response are associated with less severe PTSD presentations.

The pre-frontal cortex, more specifically the middle pre-frontal cortex, is the brain area responsible for several important executive functions such as body regulation, attuned communication, emotional modulation, response flexibility, and fear modulation (Siegal 2010). Thus the pre-frontal cortex is responsible for modification and modulation of the survival responses generated by the amygdala. In successful recovery from trauma exposure the automatic reflexive fear reaction is interrupted by messages from the pre-frontal cortex that generate strategic responses to the situation (Dowd and Proulx 2012).

From the linkages in research across the two fields it appears that MT may be a particularly apt intervention for traumatic stress related conditions. Broadly speaking, MT facilitates the executive functions of the the prefrontal cortex, the activation of the anterior cingulate cortex and insular cortex and the deactivation of amygdala activity (Wheeler et al. 2017) thus promoting self-regulation and optimal integration of mental and behavioural functioning, consequently ameliorating the kinds of symptoms generated by exposure to traumatic events (Dowd and Proulx 2012; Siegal 2009). A range of studies show that MT has benefits in enhancing pre-frontal cortex functioning and by implication, may alleviate symptoms associated with trauma (Roberts-Wolfe et al. 2012). Thus, from a neuropsychology perspective, the pre-frontal cortex functions of arousal regulation and distress tolerance are central to understanding the management of and recovery from trauma.

MT is associated with neuroplastic changes in the anterior cingulate cortex, insula, temporo-parietal junction, and fronto-limbic network that work synergistically to enhance self-regulation (Holzel et al. 2011). This would suggest that individuals who evidence neural and brain function disintegration associated with trauma symptoms may benefit from the functional integrative impact of MT. This contention is supported by Follette et al. (2006) who argue that individuals who have experienced traumatic events and are exhibiting posttraumatic stress disorder and/or related conditions would benefit from MT.

The research findings summarized below highlight many of the pre-frontal cortex functions that are activated during MT. Mindfulness reduces stress arousal and facilitates effective monitoring of internal states (Lutz et al. 2008), facilitates behavioral and emotion regulation (Heim et al. 2010; Linehan 1993; Langer and Moldoveanu 2000), reduces anxiety (Hofmann et al. 2010), reduces depression (Teasdale et al. 2000), and reduces the tendency to ruminate on distressing thoughts and images (Lutz et al. 2008). Treadway and Lazar (2009) produced an extensive literature review citing various empirical studies that demonstrate that MT can increase positive affect and cognitive vitality and decrease stress reactivity and the tendency to ruminate. Similarly, Davis and Hayes (2011) conclude that MT elicits positive emotions, minimizes

negative affect and rumination, promotes emotion regulation and response flexibility, and decreases reactivity to negative thoughts and emotions. Additionally, MT has been linked with decreased PTSD symptoms through improvements in attention and concentration; the ability to stay focused on the present with less rumination on memories of trauma; less self-judgement and greater self-compassion; as well as decreased emotional numbing, physiological arousal and anhedonia. (Frewen et al. 2015). Many of these findings may be linked neuropsychologically to the executive and self-regulatory functions of the PFC and it is evident that there is a good “match” between what trauma survivors require to overcome the neuropsychological impact of exposure and the functions that MT may facilitate in this regard.

### **Cognitive Behavioral Theories on the Mechanisms of Trauma Impact and Mindfulness Interventions**

Cognitive-behavioural writing on traumatic stress reinforces the links established between neuropsychological research on trauma impact and those that have established the primary mechanisms by means of which MT appears to be of benefit. Cognitive and behavioural theories have encompassed a range of models of mechanisms of traumatization (for example Brewin et al. 1996; Ehlers and Clark 2000; Foa et al. 1989). Based on these kinds of formulations within the traumatic stress field it is accepted that Cognitive/behavioural (CB) theorists appear to have developed the most well-established evidence-based intervention approaches for the treatment of trauma (Follette et al. 2006; Kaminer and Eagle 2010).

In summarising the common features of cognitive behavioral theories of trauma, Brewin and Holmes (2003) advise that there appears to be agreement that trauma is associated with disruptions in a wide range of psychological functioning processes including memory, attention, cognitive and affective reactions, belief systems, coping strategies, and accessing of social support. To further advance the argument that MT may be beneficial in the treatment of trauma related pathology, the section below highlights salient mechanisms of trauma impact and associated symptoms as proposed by CB theorists in conjunction with suggestions as to the corresponding mechanisms of mindfulness that may alleviate these symptoms. In particular the core features of avoidance, intrusion and negative cognitive shifts are elaborated.

### **Avoidance Addressed by the Acceptance Engendered by MT**

Avoidance, taking various forms, is generally recognised as a primary trauma symptom cluster that has the paradoxical effect of exacerbating and maintaining pathological outcomes. While the trauma victim engages in avoidance behavior in an

attempt to cope with the distress of trauma memories and associations, avoidance appears to trap the individual in an iterative loop that sustains trauma symptoms. Ehlers and Clark (2000) propose that exaggerated negative cognitive appraisals of traumatic events tend to generate situational fear as well as avoidance behavior, that in turn maintains over-generalization of anxiety. There is accumulating evidence supporting the view that elevated experiential avoidance in individuals with PTSD plays a significant role in the onset and maintenance of the disorder (Thompson et al. 2011). A further complication associated with avoidance is that traumatized individuals tend to oscillate between obsessive pre-occupation with the traumatic event and the desire to avoid all reminders of the trauma. Follette and Vijay (2009, p. 301) identify this tendency toward polarized engagement and dis-engagement as being “the central dialectic of trauma”.

MT is seen to promote a relationship of equanimity between the individual and his/her thoughts, feeling and body sensations. The individual is encouraged to observe with compassionate curiosity all that arises in his/her internal and external environment without becoming over-identified or detached from the object of awareness and attention. This process termed “reperceiving” or “intimate detachment” (Shapiro et al. 2006) may be valuable in training the individual to find balance between the two polarized tendencies of becoming overwhelmed by or overly distant from the experience of trauma.

MT promotes the acceptance and awareness of the internal and external world as is, in contrast to many western orientated psychological theories in which the approach to suffering would generally be to facilitate change in the individual's distressing internal and/or external situation. Siegal (2007) suggests that MT promotes an “approach” state that is designed to counteract the traumatized individual's tendency to avoid memories, thoughts, emotions and body sensations related to stimuli, including traumatic stimuli. MT may be seen as promoting a shift in the way an individual processes mental contents rather than attempting to change these contents (Davidson 2001). The observer and the observed become disentangled during MT and this facilitates a particular relationship of non-judgment and non-evaluation of experience. From the perspective of MT, within its location in Buddhist philosophy, the idea of “non-attachment” means that one is encouraged to accept that environmental shifts, both internal and external, are inevitable and that clinging to what is judged as pleasant, or rejecting what is unpleasant, will result in suffering. In MT the individual is invited to experience life with curiosity and to cultivate an attitude of acceptance that allows for the possibility that whatever arises (internally or externally) can be experienced with equanimity.

### **Re-Experiencing, Intrusion, Negative Cognitions/Emotions and Memory Disturbances Addressed by Distress Tolerance**

A further common feature of traumatic stress is intrusion related symptoms such as flashbacks and nightmares. Intrusions have been linked to memory distortions, another common feature of traumatic stress. Memory disturbances are a central feature of the dual representation theory (Brewin et al. 1996) in which it is contended that aspects of the traumatic experience are stored in two different memory systems. The verbally accessible memory (VAM) system contains the more consciously-processed, temporally-located memories that are encoded in the hippocampus, while the sensorially accessible memory (SAM) stores the less consciously processed, perceptually-based, and sensory memories that have not been encoded in the hippocampus. Memories that are not consciously processed are more likely to result in intrusions such as anxiety provoking, invasive images and emotions (Brewin et al. 1996).

The processing of the trauma, through the integration of the contents of these two memory systems, is seen to be dependent on reducing distressing arousal and affect by means of exposure-oriented treatments, aiming to reduce associated anxiety in order to make it possible to assimilate memories of the trauma. MT may be a useful adjunct to exposure therapy for PTSD in that it allows for the modulation of arousal and emotion while maintaining contact with disturbing images and thoughts (Follette and Vijay 2009; Rothschild 2000). In addition, there have been recent trends in trauma therapy that highlight the importance of staying fully aware of, rather than avoiding, body sensations related to traumatization (Goodman and Calderon 2012), a process that occupies a significant place in MT.

Central to the elimination of intrusive trauma symptoms and the stabilizing of memory systems is the individual's ability to tolerate the intense distress associated with trauma related intrusions. MT focuses on distress tolerance and reducing emotional reactivity to inner and outer generated experiences, enabling individuals to be guided toward approaching and assimilating intrusive material, and the activation of the PFC during mindfulness practice allows for the diminishing of fear responses. MT is also seen to be effective in counter-acting rumination, anxiety, worry, fear and anger, all of which are associated with tendencies to either avoid or over-engage with distressing thoughts and emotions (Keng et al. 2011). The individual is then able to respond with greater equanimity to whatever is being experienced, whether pleasant or distressing, without being constrained by automatic and conditioned reflex responses.

### **Negative Cognitive Schemas Addressed by Phenomenological Perspective**

Exposure to traumatic events may result in the transformation of the individual's stabilizing cognitive schemas, as reflected



in the theory of “shattered assumptions” (Janoff-Bulman 1989) and the problematic entertainment of overly negative attributions (Ehlers and Clark 2000). It is theorized that core belief systems about the world, the self and others, that have served to provide a foundational sense of predictability, trust and meaning, may be severely challenged by the experience of trauma. With regard to the changes in cognitive schema that are proposed to occur consequent upon trauma exposure, it may be argued that the particular mode of cognitive processing engendered by MT may serve to counteract the consolidation of negative cognitive schemas. MT facilitates a “bottom-up” rather than a “top-down” mode of processing information similar to what the philosopher Husserl called the second mode of processing or the phenomenological attitude, in which attention is turned toward reality simply as it appears as a flow of phenomena without cognitive mediation (Brown and Cordon 2009). Shapiro et al. (2006) extend this description of mindfulness arguing that mindfulness allows the individual to suspend interpretation and analysis of experience and to attend to experience as it arises in the present moment, adopting a phenomenological perspective towards everyday life. It may be extrapolated from this description that MT has the potential to facilitate present moment experience, unprejudiced by the impact of negative cognitive schema.

Ehlers and Clark (2000) propose that a characteristic feature of traumatic stress is what they term “mental defeat”, a phenomenon that appears to be related to the destruction of functional and healthy schemas about the self. This concept refers to a profound sense of helplessness and disempowerment where the traumatized individual may perceive him/herself as having become unworthy, lacking in agency, and defeated. A related point is that trauma is often associated with self-blame, shame and trauma-related guilt (Bockers et al. 2016), which in turn can lead to states of paralysis and powerlessness. Again MT may prove beneficial in counteracting tendencies towards mental defeat, self-recrimination and/or survivor guilt in promoting greater acceptance of reality as it is, or has been experienced, and in encouraging self and other acceptance.

According to Shapiro et al. (2006) intention, attention, and attitude, are the three core mechanisms of MT that are simultaneously activated during “re-perceiving”. Bishop et al. (2004, p.232) describe the attitudinal component as “adopting a particular orientation toward one’s experience that is characterized by curiosity, openness, and acceptance”. Siegal (2007) extends this description to include compassion, openness and acceptance. In this light, MT may provide a potent response to the “mental defeat” of the traumatized individual and may assist in re-constructing belief systems that serve to create or restore functional meaning systems in relation to the self, the world and others.

Traditionally, MT practices encourage the development of an attitude of compassion as exemplified in the Buddhist “Metta or loving-kindness meditation” which was incorporated into the MBSR program and into most MT programs. Compassion for sentient and non-sentient beings and self-compassion is a key focus in MT and this practice may be useful in facilitating the re-entertainment of the idea that the world can be a benevolent place in which (at least some) others and the self may be trusted. The self-compassion, acceptance, and emotional flexibility that is engendered in MT may counteract trauma symptoms related to negative, hostile and defeatist attributions and may assist individuals to survive with greater equanimity, freeing them to be able to devote psychic energy to other tasks or activities.

In a review of theoretical and empirical literature on the impact of MT on trauma symptoms, four main categories of influence emerge as pertinent: present moment awareness and a non-judgmental acceptance of distressing internal states and trauma-related triggers; decreased arousal and stress reactivity; attention control involving selective switching or sustaining of attention to stimuli on an adaptive basis; and finally, effective engagement in psychotherapy treatment by fostering increased openness and awareness of thoughts and feelings (Vujanovic et al. 2011). This summary appears to resonate well with the dimensions of impact elaborated with regard to the range of symptom clusters discussed above.

## Research Evidence Related to Mindfulness Interventions and Traumatic Stress

Holzel et al. (2011) propose a meta-analytic model on the benefits of mindfulness supported by an extensive review of empirical research drawn from both cognitive and neuroscience studies. They contend that the cognitive mechanisms of mindfulness comprise four core components: attention regulation, body awareness, emotion regulation (including reappraisal and exposure, extinction and reconsolidation), and change in perspective on the self. As discussed thus far it would seem that all of these dimensions of mindfulness contribute meaningfully to understanding how MT may address trauma symptoms and build resilience.

While South African research on mindfulness is very limited to date, Ives-Deliperi (2008) conducted a series of four studies to investigate the cognitive and neural mechanisms associated with the adoption of mindfulness practices amongst members of the South African population. In a matched-control, clinical intervention study comprising 206 volunteer participants she concluded that the evidence supports MT as an intervention to improve affective and cognitive well-being and to reduce vulnerability to stress. Of relevance to the current discussion is Ives-Deliperi’s (2008) identification of ten, what might be termed “sub-mechanisms” of mindfulness: self-regulation, exposure, cognitive flexibility, acceptance,

dis-identification, awareness/insight, reattribution, attention, meta-cognition and relaxation. International studies have identified similar sub-mechanisms including: attention regulation (Brown and Ryan 2003; Treadway and Lazar 2009); decreased habituation (Jha et al. 2007); meta-cognitive awareness (Kocovski et al. 2009); decreased rumination (Jain et al. 2007); increased acceptance (Treadway and Lazar 2009); and decreased experiential avoidance (Kocovski et al. 2009). Evidently, there are a wide range of cognitive mechanisms implicated in MT many of which appear to be related to the executive functions of the pre-frontal cortex brain region and many of which appear to be potentially beneficial in the amelioration of traumatic stress related conditions.

### Empirical Support for MT as an Effective Trauma Intervention

In addition to the theoretical and research evidence that MT produces various psychological benefits, there is a growing research base on the impact of MT specifically on trauma related conditions. The research on MT impact validates MT as an effective treatment for trauma on populations as varied as women who have experienced intimate partner violence or interpersonal trauma (Dutton et al. 2013; Smith 2009), patients managing cancer diagnosis related trauma (Bränström et al. 2010), adult survivors of childhood sexual abuse and cumulative trauma (Bolduc et al. 2018; Kimbrough et al. 2010), firefighters (Smith et al. 2011) and war veterans (Müller-Engelmann et al. 2017; Schure et al. 2018; Stephenson et al. 2017). Some of these research findings are elaborated further.

MT was found to be effective in reducing PTSD symptoms amongst war veterans, teaching them to recognize trauma triggers and distressing emotional states and to cultivate the psychological flexibility required to engage effectively in treatment leading to decreases in hyper-arousal and stress reactivity (Vujanovic et al. 2011). Kearney et al. (2013) found sustained positive impact of MBSR four months after intervention in a randomised control study conducted on 47 veterans. A pilot study by Goldsmith et al. (2014) found that an MBSR intervention with nine adults with PTSD symptoms and depression substantially reduced shame-based trauma appraisals. Another study, conducted on 27 adult survivors of childhood sexual abuse, found sustained improvements in trauma related symptoms up to 24 weeks after participation in MT, with avoidance and numbing related PTSD symptoms particularly being greatly reduced (Kimbrough et al. 2010). Although limited in generalizability by small sample sizes, findings from these studies conducted on a diverse range of traumatized populations support the proposition that MT can effectively reduce primary trauma symptoms.

A more recent randomized control trial (RCT) study based upon research with a larger sample of 116 veterans suffering

from PTSD compared MT with present-centered group therapy (Polusny et al. 2015) Results provide further support for the positive impact of MT for PTSD and depression related symptoms, both on immediate assessment after completion of an MBSR program and at 2 months follow-up. There is thus evidence suggesting that the effects of MT in ameliorating trauma symptoms may be sustainable.

The results of three recent meta-analytic reviews provide further convincing support to the growing evidence-base that MT is effective in ameliorating trauma symptoms. Banks et al. (2015) in a systematic review of 12 studies reported positive outcomes on the impact of MT on PTSD post intervention, and found that these improvements were sustained from between 4 to 30 months post-intervention. The authors conclude that there is pre-preliminary evidence for the use of MT to treat trauma but called for the execution of more studies with greater methodological rigour. Hopwood and Schutte's (2017) meta-analytic investigation refined their criteria for inclusion, reviewing only impact studies that met RCT design criteria. Their review of studies conducted on the impact of MT on PTSD covered the recent period of 2008 to 2016. In the total sample of 1219 participants across the 18 studies reviewed, MT was generally found to have had a significant impact on reducing symptoms of PTSD (Hopwood and Schutte 2017). Similarly, Boyd et al. (2018) contribute evidence from their scoping literature review, observing that MT in general impacts positively on PTSD symptoms with medium to large effect sizes. Additionally, they report neurobiological evidence showing that MT may effectively restore large-scale brain network connectivity in PTSD sufferers thus lending further credibility to the theorization of the neuroplastic changes associated with MT.

It is evident that research into the impact of MT on traumatic stress related responses and conditions, albeit relatively recent and requiring further consolidation, suggests considerable efficacy in reducing a range of symptoms and the possibility of sustained benefits. The meta-analytic studies are particularly convincing in providing a critical overview perspective and it is evident that positive findings are being generated even from more rigorous RCT based studies (Creswell 2017).

### Continuous Trauma Exposure: Mindfulness, Neuroplasticity and Building Resilience

Thus far we hope to have presented a convincing case to suggest that MT is an effective intervention for trauma related responses and psychological conditions in general. In this second broad section of the paper we seek to emphasize the place of MT as a prophylactic and resilience building intervention for complex forms of traumatic stress. We propose that MT may be particularly beneficial in contexts in which exposure to multiple and continuous trauma is extensive. Within such

environments it is evident that individuals and communities feel severely constrained in terms of the options open to them to manage exposure to violence and threat. On the one hand individuals may become hypervigilant, constantly attempting to gage situations in anticipation of impending danger and contributing to a rather pervasive sense of mistrust, irritability and suspicion. On the other hand, the sense of mental defeat may be exaggerated with tendencies towards social withdrawal, resignation, cynicism and hopelessness. For a variety of logistical reasons affecting both treatment seekers and providers, such as accessibility of services and case-load management, it is also the case that for those facing recurrent traumatization it is not viable to seek formal treatment on a (semi-)permanent basis. This is despite recognition that external circumstances are such as to contribute to likelihood of ongoing exposure to traumatic stressors and that guarantees of safety are not possible. Within such conditions the availability of an intervention approach that promises consolidation of beneficial change and enduring impact is immensely appealing. The neuroplastic changes associated with MT suggest that the intervention may assist in this kind of manner, being designed not only to reduce immediate trauma symptoms but also to build long-term psychological resilience.

Research reveals that MT impacts at the palliative level of symptom relief, and with repeated practice, simultaneously promotes the building of personal psychological resources and resilience (Brown and Ryan 2003; Davidson et al. 2003; Siegal 2010; Keng et al. 2011). The mindfulness state may be cultivated and developed through MT and may ultimately promote the development of mindfulness traits (Siegal 2007) through neuroplastic alterations (Shapiro et al. 2004). With more extended “practice” of mindfulness the brain is understood to change in both structure and function (Davidson et al. 2003). Mindfulness practice induces a state of brain activation that with repetition can become an enduring mode of responding to everyday life (Siegal 2009), including to ongoing stressful experiences. Recipients of MT may become autonomous practitioners of mindfulness over time as this becomes a way of being rather than therapeutic-input reliant. This is one of the egalitarian aspects of mindfulness – once comprehended the recipient can become an autonomous practitioner. Thus, MT may be effective as both a treatment and preventative approach to trauma impact, in a sense potentially providing some level of “stress inoculation” for individuals who are exposed to repeated trauma.

The hypothesis that MT produces both functional and structural neuro-plastic changes in the brain has been empirically validated by neuroscientific research. Davidson et al. (2003) investigated the impact of an eight-week MBSR intervention on brain and immune functions and were able to demonstrate that in comparison with non-meditators meditators showed significant increases in left-sided anterior activation, a pattern associated with positive affect states. At the end of

the MBSR intervention both experimental and control participants were vaccinated with an influenza vaccine. It was found that there was a significant increase in antibody titers among subjects in the meditation group as compared to those in the wait-list control group and that the magnitude of increase in left-sided activation predicted the magnitude of antibody titer rise to the vaccine (Davidson et al. 2003). While these findings pertain to physiological risk and immunity it is possible to infer that MT may also provide a form of immunity to psychological stressors. In the small body of writing on interventions for CTS (Kaminer et al. 2018) and OTSR (Diamond et al. 2010; Nuttman-Shwartz and Shoval-Zuckerman 2016) it has been proposed that aspects of mindfulness may well be helpful in addressing both excessive arousal and anxiety and pessimism and helplessness associated with living circumstances. One of the cardinal features of CTS is the difficulty in discriminating between real and imagined or anticipated threats within the environment (Eagle and Kaminer 2013). Optimal threat detection is important for survival and minimization of harm and yet over-generalization of anxiety to a range of threat cues can deplete psychological resources and lead to suspicious and constrained ways of dealing with people and the environment, in turn compromising supportive social network bonds (Eagle 2015). As discussed previously, MT contributes to the development of a particular kind of attentional awareness that may allow for optimal alertness to environmental cues without the associated anxiety that CTS produces. Individuals may feel that they are sufficiently aware of their environment to trust that they can respond adaptively to minimize threat of harm without either being flooded by anxiety or succumbing to resignation. In addition, CTS has been associated with the potential development of health related problems, such as hypertension and headaches, as is commonly the case with chronic stress exposure. MT is also viewed as potentially beneficial for these kinds of psychosomatic presentations that may accompany CTS (Kaminer et al. 2018) and as indicated previously may improve immunological functioning.

Although it is difficult to predict under what circumstances recipients of MT are likely to sustain the practices associated with such inputs it is important to note that the exercises are not tied to access to material resources, such as computers, but rather require cultivating certain states of mind. Such states of mind may enable people to live with greater equanimity under conditions of violence and threat when these are inescapable. Interestingly in a study conducted with college students exposed to continuous threat in Israel, acceptance as a coping style was found to be beneficial in reducing the risk of pathology (Nuttman-Shwartz and Dekel 2009). This is not to suggest that mindfulness equates to resignation and in fact it could be argued that some degree of freedom from the intense anxiety associated with such conditions may free up psychic energy to engage in the world in more proactive and

communitarian ways. While engagement with this aspect of mindfulness entails more extended philosophical discussion, it is evident that within its Buddhist roots mindfulness also assumes the development of increased compassion and respect for others and one's environment and that this too may be beneficial in situations of enduring intergroup or civil conflict. The practice of mindfulness may thus assist not only with the amelioration of individual distress but may play some role in assisting people to build social support networks in contexts of ongoing threat. This is not to suggest that MT should be viewed as a panacea for all forms of traumatization but rather to suggest that the cultivation of the kinds of states of mind associated with being mindful may be beneficial in contexts of inescapable threat and that the enduring benefits of MT may be important in situations where trauma exposure may reoccur.

### **Mindfulness as Appropriate Intervention in Contexts of Limited Mental Health Resources**

The discussion thus far has sought to build a compelling case that MT appears to offer a holistic approach to dealing with the impact of traumatic stressors and may provide resilience building in the face of the kind of multiple and continuous trauma exposure that tends to be more prevalent in LMIC's (Stevens et al. 2013). It may seem, however, that MT may not be easily viewed as compatible with community-based interventions given the association of MT with middle class preoccupations and privileges in the West as briefly discussed at the outset of the article. Those who have critiqued the popularization of mindfulness over the past decade or so suggest that it has been appropriated to some extent by positive psychology, with connotations of "entitlement" to happiness and commercialization of training. However, we argue that re-appropriation of mindfulness in the interests of those who suffer and who live in under-resourced communities may be both possible and desirable.

The number of people in SA who suffer from exposure to traumatic stressors and their impact far outstrip the number of service providers available to offer therapeutic interventions. One of the ongoing challenges in the humanitarian and mental health terrain is to develop and implement interventions for traumatic stress related conditions that are able to meet the burden of demand within SA society across a wide range of contexts. Kazdin (2014) has proposed a model of mental health service delivery that appears to be directly relevant to thinking through aspects of mental health care and community-oriented delivery in relation to traumatization in limited resource contexts. We argue that MT appears to fulfill many of the best practice criteria for interventions that he advocates. In a commentary on global mental health service delivery, Kazdin (2014) argues that the current widespread use of the one-to-one model of psychological intervention fails to

meet the scale of demand in society. He suggests that the convergence of the following problems creates the necessity for the development of innovative models of mental health service delivery: high rates of psychiatric disorders in community samples; the absence of psychological services for most individuals in need of treatment; the paucity of services for vulnerable individuals with the greatest needs; and the paucity of service delivery professionals.

Kazdin (2014) proposes that four key concepts need to be borne in mind in optimizing service delivery to meet broad social needs, these being *reach*, *scalability*, *affordability*, and *expansion of nonprofessional service delivery*. We propose that MT may be a good fit in terms of meeting these optimal service delivery criteria and briefly discuss each with respect to mindfulness and trauma related interventions.

*Reach* in Kazdin's model refers to the capacity to access people who are not well served by traditional one-on-one service delivery models. Services may also need to extend beyond secondary interventions designed to treat those suffering from clearly diagnosable mental illnesses to meeting the needs of those with more hidden difficulties and those who may not conventionally utilize mental health services. Although the mechanisms for achieving such reach would need to be developed, for example by accessing women's organizations or schools, there is evidence that MT may have benefit for the kinds of groups on the margins who may benefit from such interventions. MT was initially designed to be offered in a group format and has been implemented with participants ranging from children (Burke 2010) to older adults (Alexander et al. 1989). The renowned MBSR program (Kabat-Zinn 1982) is an intervention in which group discussions and active group participation play a role in effecting change. Considering the volumes of people exposed to traumatic stress in LMIC's such as SA and limited numbers of professionally trained service providers, group format MT interventions offer *reach* and seem ideally suited to this form of implementation.

*Scalability* refers to the capacity for an intervention to be applied on a large scale. As already discussed, MT may be executed in group formats across a range of different contexts. Internationally, MT is currently being offered in a range of non-conventionally therapeutic settings such as schools, general health clinics, and corporate organisations (Purser and Loy 2013). It is evident that MT interventions can be up-scaled to teach large numbers of people at the same time. Although caution is probably required in terms of the maximum number of people that can be trained with good efficacy, MT approaches certainly offer a more flexible large-scale mode of the delivery than individual therapy. While there would have to be acceptance and commitment from those in organizational formations, MT is a non-intrusive (and increasingly non-sectarian) form of intervention that can be adapted for personal use. In a sense then, the growing



popularity and proliferation of MT interventions may provide a useful platform from which to promote the employment of such programs in contexts and communities where it may be most needed.

*Affordability* is also understood to be a vital component of more socially responsive mental health interventions. Kazdin indicates that it is important for interventionists to develop low cost modes of delivery that are not solely reliant on highly trained graduate professionals. Many mindfulness-based interventions are offered on an eight-week basis, sometimes with further intermittent follow-up. This kind of time commitment seems reasonable to expect of people living in resource constrained contexts given the kind of cost benefit ratio offered by such interventions. Once traumatized individuals (in this instance) have received intervention, they may continue to self-regulate and self-employ their training without further need for a trainer.

It can also be argued that MT resources are widely and freely available to the public. For example, free online training materials on mindfulness make this intervention an accessible option for those who have access to computers and cell-phones (van Emmerik et al. 2018). Research on the efficacy of modes of MT such as online and self-help methods is meagre relative to the traditional methods, such as MBSR training over 8 weeks with a trainer. However, those studies that have investigated online and self-training methods report positive results. For example, Dimidjian et al. (2014) investigated the impact of online MBCT on depression symptoms with a sample size of 100 and found a significant increase in self-reported Mindfulness and significant decrease in both depression and rumination in the treatment group in comparison with the control group. Another RCT on the effectiveness of self-help mindfulness-based cognitive therapy with a sample of 80 students reported significant impact of web-based MT on measures of depression, anxiety, stress, satisfaction with life, mindfulness, and self-compassion in the treatment group and concluded that online MT has the potential to be a low-cost, readily available effective intervention. (Taylor et al. 2014).

Two recent meta-analyses and systematic reviews conducted on the effectiveness of online MT both report on the significant impact of MT online on various mental health outcomes (Sevilla-Llewellyn-Jones et al. 2018; Spijkerman et al. 2016). The findings indicate that online MT has the potential to contribute to improving mental health outcomes, particularly stress. Other studies have also reported on the feasibility and positive impact of shorter-term and online MT programs (Banerjee et al. 2018; Cavanagh et al. 2013; Krusche et al. 2013; Taylor et al. 2014). It could be questioned whether such programs would be accessible to people living in LMIC's, but it is noteworthy that health related applications in relation to a range of health conditions are already being implemented in such contexts and that cell phone access in particular is widespread across the African continent (Goldbach et al. 2013).

While some have bemoaned the lack of standardization and quality control that the proliferation of mindfulness approaches has introduced, the other side of this coin is that "ownership" and patenting of MT is not possible, meaning that there is more egalitarian access to the knowledge and practice base. MT can be offered and accessed without incurring unnecessarily high costs.

Kazdin also advocates for the introduction of modes of mental health service delivery that can include *nonprofessionals*. He recommends increasing numbers of intervention providers, expanding service provision sites and adapting interventions to varying local conditions to reach diverse groups. In LMIC environments it is important to develop interventions that can be offered by auxiliary health workers as professional service providers are limited in number and often work under highly stressful conditions in attempting to cope with very high patient volumes. What is envisaged is that initial mindfulness training may be offered by experienced practitioners to groups of people who may be invested not only in their own welfare but also in becoming exponents of the principles and methods themselves. For example, teachers, nurses, occupational therapists, social workers, and community development workers may find benefit in becoming self-practitioners of mindfulness and subsequently in becoming trainers and supporters of others' development. In this respect MT could become part of primary mental health care services and could be used both acutely and prophylactically to address or manage traumatic stress impact (amongst other conditions) before it becomes intractable or syndromic. The possibility of skills benefit that is both personal and communal may also be attractive in this instance.

It should be evident that MT interventions may be offered at a relatively low cost in under-resourced areas and may be incorporated into existing practices as an effective community psychology intervention. MT has shown empirically validated benefits across a wide range of psychological and psychiatric conditions and appears to be a comprehensive, affordable, holistic form of intervention that addresses multiple psychological problems on multiple levels. MT is usually offered in group format and can be delivered by non-professionals as well as professionals. It is also an approach in which there is minimal risk of harm as the methods are non-intrusive and designed to be integrated and practiced in a manner that is personally resonant for each individual. As has already been argued, it is also the case that mindfulness may produce enduring benefits for those for whom it becomes a way of life or 'trait'.

## Challenges and Recommendations

In evaluating the arguments put forward in the paper some cautions are warranted and are elaborated as possible limitations in implementing MT interventions in the kinds of

contexts we have proposed. Firstly, it should be acknowledged that the eight-week time period commitment required for most MT's, such as the MBSR training program, may result in participants dropping out from the training for various resource related, logistical and/or personal reasons. It may be necessary to adapt and tailor-make MT to suit logistical constraints such as time and resources. The research cited earlier does indicate that shorter MT programmes, online programmes as well as self-study MT may still have benefit. It is also possible that for people living in high violence contexts there may be some appreciation of the opportunity to connect with other individuals on a weekly basis over a more extended period of time, even if there are constraints in reaching venues, and in refugee camps participation in training may also act to solidify relationships amongst displaced people.

Secondly it is important that sensitivity to cultural and contextual issues is encouraged in the implementation of MT, as would be the case in applying any psychological intervention method designed for a context other than that within which it is being utilized. The secularisation of MT, while controversial for some, does make MT more accessible to individuals of varied cultural backgrounds. MT may be promoted as a form of "mental training" with explicitly stated benefits for mental well-being and health in the same way that physical training impacts on physical health, and in this sense may be presented as a more generally applicable kind of intervention. Mindfulness interventions have been employed to some benefit with African-American groups in poor inner city areas (Dutton et al. 2013), suggesting that the principles can be usefully applied across different populations. There is also the possibility that the cultivation of awareness of the self in environment in MT may resonate with African belief systems in which mind-body and human-physical environment connections are strongly entertained.

Thirdly, it should be acknowledged that the possible adverse impacts of MT have not been adequately researched and little information on any negative outcomes has been reported in the literature. It is recommended MT be delivered with the same level of clinical caution that informs the implementation of other psychotherapeutic intervention for traumatic stress conditions (Briere and Scott 2014). Given the fact that MT is not designed to engage directly with traumatic material, as is the case in exposure-based therapies, the risk of re-traumatization is low. However, it is possible that for individuals with severe PTSD symptoms, MT may need to be used in conjunction with other best practice interventions that are designed to implement exposure based interventions, for example, as discussed earlier.

Taking account of conditions for professional and ethical mental health service delivery, ongoing critical evaluation of

MT is recommended with attention to utilizing MT in accordance with the evidence derived from the rapidly growing research literature. At this stage it may be judicious to view MT as an invaluable complement to other forms of psychotherapeutic interventions for traumatic stress. Recently two leading organizations in the field of psychological trauma management have made recommendations in support of this kind of proposal. In 2011 the American Department of Veteran affairs, based upon consolidation of existing research findings, recommended that MT could be used by itself or together with other traditional treatment practices as an effective response to PTSD (Briere and Scott 2014). The International Society for Traumatic Stress Studies Complex Trauma Task Force conducted an expert opinion survey to identify best practices for the treatment of Complex Traumatic Stress Disorder (CTSD) and found that there was strong support for meditation and mindfulness interventions as second-line treatments for CTSD (Cloitre et al. 2011). While these taskforce recommendations do not speak directly to implementing MT in the kinds of contexts we have foregrounded in this paper, they indicate that there is increasing receptivity to these kinds of interventions in mainstream trauma treatment.

In conclusion we argue that there is a compelling case for the application and implementation of MT in high violence, low mental health resource contexts. It is evident that MT may have particular benefit for individuals suffering not only from PTSD and acute traumatic stress conditions but also for those living under conditions of ongoing and continuous exposure to violence and threat. The beneficial effects of mindfulness encompass neurological, somatic, cognitive, attitudinal, interpersonal and existential dimensions, all of which have resonance for traumatic stress conditions. In addition, MT can be offered to groups of individuals at low cost by both professional and auxiliary care workers in a range of humanitarian settings. In this respect we argue that promotion of mindfulness in such contexts represents an alignment of practice with core philosophical premises.

**Authors' Contributions** The article was jointly conceptualized by Author 1 and Author 2. Author 1 produced the first draft of the text. Author 2 then added to the text and refined the arguments in the text. Both authors therefore contributed substantively to the writing of the manuscript with Author 1 contributing more material to the overall manuscript and therefore taking first authorship.

Pillay Contributed to conceptualization and first draft of full article and subsequently to further refinement of the manuscript based on feedback from Eagle. Pillay also did final preparation of the manuscript for submission.

Eagle Contributed to conceptualization of article and wrote several sections of the manuscript. She contributed to refining argumentation and re-ordering of initial material for coherence. She also contributed to editing of several drafts.

## Compliance with Ethical Standards

**Conflict of Interest** On behalf of both authors, the corresponding author states that there is no conflict of interest.

**Ethics Statement** The article is based on conceptual and theoretical arguments and does not include data based on research on human subjects.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

## References

- Alexander, C. N., Langer, E. J., Newman, R. I., Chandler, H. M., & Davies, J. L. (1989). Transcendental meditation, mindfulness, and longevity: An experimental study with the elderly. *Journal of Personality and Social Psychology*, 57(6), 950.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub.
- Banerjee, M., Cavanagh, K., & Strauss, C. (2018). Barriers to mindfulness: A path analytic model exploring the role of rumination and worry in predicting psychological and physical engagement in an online mindfulness-based intervention. *Mindfulness*, 1–13.
- Banks, K., Newman, E., & Saleem, J. (2015). An overview of the research on mindfulness-based interventions for treating symptoms of posttraumatic stress disorder: A systematic review. *Journal of Clinical Psychology*, 71(10), 935–963.
- Bishop, S. R., Lau, M., Shapiro, S. L., Carlson, L., Anderson, N. D., & Carmody, J. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11, 230–241.
- Bockers, E., Roepke, S., Michael, L., Renneberg, B., & Knaevelsrud, C. (2016). The role of generalized explicit and implicit guilt and shame in interpersonal traumatization and posttraumatic stress disorder. *The Journal of Nervous and Mental Disease*, 204(2), 95–99.
- Bolduc, R., Bigras, N., Daspe, M. È., Hébert, M., & Godbout, N. (2018). Childhood cumulative trauma and depressive symptoms in adulthood: The role of mindfulness and dissociation. *Mindfulness*, 1–10.
- Boyd, J. E., Lanius, R. A., & McKinnon, M. C. (2018). Mindfulness-based treatments for posttraumatic stress disorder: A review of the treatment literature and neurobiological evidence. *Journal of Psychiatry & Neuroscience*, 43(1), 7.
- Bränström, R., Kvillemo, P., Brandberg, Y., & Moskowitz, J. T. (2010). Self-report mindfulness as a mediator of psychological well-being in a stress reduction intervention for cancer patients—A randomized study. *Annals of Behavioral Medicine*, 39(2), 151–161.
- Brewin, C. R., & Holmes, E. A. (2003). Psychological theories of post-traumatic stress disorder. *Clinical Psychology Review*, 23(3), 339–376.
- Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review*, 103(4), 670.
- Briere, J. N., & Scott, C. (2014). Principles of trauma therapy: A guide to symptoms, evaluation, and treatment (DSM-5 update). Sage Publications.
- Brown, K. W., & Cordon, S. (2009). Toward a phenomenology of mindfulness: Subjective experience and emotional correlates. In F. Didonna (Ed.), *Clinical handbook of mindfulness* (pp. 59–98). New York: Springer.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822–848.
- Burke, C. A. (2010). Mindfulness-based approaches with children and adolescents: A preliminary review of current research in an emergent field. *Journal of Child and Family Studies*, 19(2), 133–144.
- Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper, A., & Jones, F. (2013). A randomised controlled trial of a brief online mindfulness-based intervention. *Behaviour Research and Therapy*, 51(9), 573–578.
- Cloitre, M., Courtois, C. A., Charuvastra, A., Carapezza, R., Stolbach, B. C., & Green, B. L. (2011). Treatment of complex PTSD: Results of the ISTSS expert clinician survey on best practices. *Journal of Traumatic Stress*, 24(6), 615–627.
- Creswell, J. D. (2017). Mindfulness interventions. *Annual Review of Psychology*, 68, 491–516.
- Cullen, M. (2011). Mindfulness-based interventions: An emerging phenomenon. *Mindfulness*, 2(3), 186–193.
- Davidson, M. L. (2001). Relations between post-traumatic symptomatology, disruptions in cognitive schemata and coping in emergency care practitioners. In *Unpublished masters dissertation*. Johannesburg: University of Witwatersrand.
- Davidson, R. J., Kabat-Zinn, J., Shumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., . . . Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, 65, 564–570.
- Davis, D. M., & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy*, 48(2), 198–208.
- Diamond, G. M., Lipsitz, J. D., Fajerman, Z., & Rozenblat, O. (2010). Ongoing traumatic stress response (OTSR) in Sderot, Israel. *Professional Psychology: Research and Practice*, 41(1), 19–25.
- Didonna, F. (2009). *Clinical handbook of mindfulness*. New York: Springer.
- Dimidjian, S., Beck, A., Felder, J. N., Boggs, J. M., Gallop, R., & Segal, Z. V. (2014). Web-based mindfulness-based cognitive therapy for reducing residual depressive symptoms: An open trial and quasi-experimental comparison to propensity score matched controls. *Behaviour Research and Therapy*, 63, 83–89.
- Discovery Health. (2014). *Mind over matter - how mindfulness can fix, virtually everything* [Press release]. Retrieved from <http://www.mynewsdesk.com/za/discovery-holdings-ltd/pressreleases/tag/drellen-langer>
- Dowd, D. A., & Proulx, J. (2012). Neurology and trauma: Impact and implications. In *Manitoba*. Canada: RESOLVE University of Manitoba Press.
- Dutton, M. A., Bermudez, D., Matas, A., Majid, H., & Myers, N. L. (2013). Mindfulness-based stress reduction for low-income, predominantly African American women with PTSD and a history of intimate partner violence. *Cognitive and Behavioral Practice*, 20(1), 23–32.
- Eagle, G. (2015). Crime, fear and continuous traumatic stress in South Africa: What place social cohesion? *Psychology in Society*, (49), 83–98.
- Eagle, G., & Kaminer, D. (2013). Continuous traumatic stress: Expanding the lexicon of traumatic stress. *Peace and Conflict: Journal of Peace Psychology*, 19(2), 85–99.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38(4), 319–345.
- Foa, E. B., Steketee, G., & Rothbaum, B. O. (1989). Behavioral/cognitive conceptualizations of post-traumatic stress disorder. *Behavior Therapy*, 20(2), 155–176.
- Follette, V. M., & Vijay, A. (2009). Mindfulness for trauma and post traumatic stress disorder. In F. Didonna (ed) (2009) *Clinical Handbook of Mindfulness* (pp. 299–317). New York: Springer.
- Follette, V., Palm, K. M., & Pearson, A. N. (2006). Mindfulness and trauma: Implications for treatment. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 24(1), 45–61.



- Frewen, P., Rogers, N., Flodrowski, L., & Lanius, R. (2015). Mindfulness and meta-based trauma therapy (MMTT): Initial development and proof-of-concept of an internet resource. *Mindfulness*, 6(6), 1322–1334.
- Goldbach, H., Chang, A. Y., Kyer, A., Ketschogileng, D., Taylor, L., Chandra, A., et al. (2013). Evaluation of generic medical information accessed via mobile phones at the point of care in resource-limited settings. *Journal of the American Medical Informatics Association*, 21(1), 37–42.
- Goldsmith, R. E., Gerhart, J. I., Chesney, S. A., Burns, J. W., Kleinman, B., & Hood, M. M. (2014). Mindfulness-based stress reduction for posttraumatic stress symptoms: Building acceptance and decreasing shame. *Journal of Evidence-based Complementary & Alternative medicine*, 19(4), 227–234.
- Goodman, R. D., & Calderon, A. M. (2012). The use of mindfulness in trauma counselling. *Journal of Mental Health Counselling*, 34(3), 254–268.
- Heim, C., Shugart, M., Craighead, W. E., & Nemeroff, C. B. (2010). Neurobiological and psychiatric consequences of child abuse and neglect. *Developmental Psychobiology*, 52, 671–690.
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 78(2), 169.
- Holzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537–559.
- Hopwood, T. L., & Schutte, N. S. (2017). A meta-analytic investigation of the impact of mindfulness-based interventions on post traumatic stress. *Clinical Psychology Review*, 57, 12–20.
- Ives-Deliperi, V. (2008). An investigation into the cognitive and neural mechanisms of Mindfulness. Unpublished doctoral thesis. University of Cape Town, South Africa.
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., & Bell, I. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, 33(1), 11–21.
- Janoff-Bulman, R. (1989). Assumptive worlds and the stress of traumatic events: Applications of the schema construct. *Social Cognition*, 7, 113–136.
- Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies sub- systems of attention. *Cognitive, Affective, & Behavioral Neuroscience*, 7(2), 109–119.
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, 4, 33–47.
- Kabat-Zinn, J. (1990). *Full catastrophe living*. New York: Bantam Doubleday Dell Publishing Group.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kaminer, D., & Eagle, G. (2010). *Traumatic stress in South Africa*. Johannesburg: Wits University Press.
- Kaminer, D., Eagle, G., & Crawford-Browne, S. (2018). Continuous traumatic stress as a mental and physical health challenge: Case studies from South Africa. *Journal of Health Psychology*, 23(8), 1038–1049.
- Kazdin, A. E. (2014). Evidence-based psychotherapies II: Changes in models of treatment and treatment delivery. *South Africa Journal of Psychology*, 45(1), 3–21.
- Keamey, D. J., McDermott, K., Malte, C., Martinez, M., & Simpson, T. L. (2013). Effects of participation in a mindfulness program for veterans with posttraumatic stress disorder: A randomised controlled pilot study. *Journal of Clinical Psychology*, 69(1), 14–27.
- Keng, S., Smoski, M., & Robins, C. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31, 1041–1056.
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., et al. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33(6), 763–771.
- Kimbrough, E., Magyar, T., Langenberg, P., Chesney, M., & Berman, B. (2010). Mindfulness intervention for child abuse survivors. *Journal of Clinical Psychology*, 66(1), 17–33.
- Kocovski, N. L., Segal, Z. V. & Battista, S. R. (2009). Mindfulness and psychopathology: Problem formulation. In F. Didonna (ed) (2009) *Clinical Handbook of Mindfulness*. New York: Springer.
- Krusche, A., Cyhlarova, E., & Williams, J. M. G. (2013). Mindfulness online: An evaluation of the feasibility of a web-based mindfulness course for stress, anxiety and depression. *BMJ Open*, 3(11), e003498.
- Langer, E. J., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues*, 56(1), 1–9.
- Linehan, M. M. (1993). *Skills training manual for treating borderline personality disorder: Diagnosis and treatment of mental disorders*. New York: Guilford Press.
- Lutz, A., Stager, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring in meditation regulation. *Trends in Cognitive Sciences*, 12(14), 163–169.
- Müller-Engelmann, M., Wunsch, S., Volk, M., & Steil, R. (2017). Mindfulness-based stress reduction (MBSR) as a standalone intervention for posttraumatic stress disorder after mixed traumatic events: A mixed-methods feasibility study. *Frontiers in Psychology*, 8, 1407.
- Nuttman-Shwartz, O., & Dekel, R. (2009). Ways of coping and sense of belonging in the face of a continuous threat. *Journal of Traumatic Stress*, 22(6), 667–670.
- Nuttman-Shwartz, O., & Shoval-Zuckerman, Y. (2016). Continuous traumatic situations in the face of ongoing political violence: The relationship between CTS and PTSD. *Trauma, Violence & Abuse*, 17(5), 562–570.
- Olendzki, A. (2009). Mindfulness and meditation. In F. Didonna (Ed.), *Clinical handbook of mindfulness* (pp. 37–44). New York: Springer.
- Polusny, M. A., Erbes, C. R., Thuras, P., Moran, A., Lamberty, G. J., Collins, R. C., et al. (2015). Mindfulness-based stress reduction for posttraumatic stress disorder among veterans: A randomized clinical trial. *Jama*, 314(5), 456–465.
- Purser, R., & Loy, D. (2013). Beyond McMindfulness. *Huffington Post*, 1(7), 13.
- Roberts-Wolfe, D., Sacchet, M., Hastings, E., Roth, H., & Britton, W. (2012). Mindfulness training alters emotional memory recall compared to active controls: Support for an emotional information processing model of mindfulness. *Frontiers in Human Neuro-science*, 6(15).
- Rothschild, B. (2000). *The Body Remembers: The Psychophysiology of Trauma and Trauma Treatment*. New York: Norton.
- Scaer, R. (2001). *The body bears the burden*. New York: Hawthorne Press.
- Schure, M. B., Simpson, T. L., Martinez, M., Sayre, G., & Kearney, D. J. (2018). Mindfulness-based processes of healing for veterans with post-traumatic stress disorder. *The Journal of Alternative and Complementary Medicine*.
- Sevilla-Llewellyn-Jones, J., Santesteban-Echarri, O., Pryor, I., McGorry, P., & Alvarez-Jimenez, M. (2018). Web-based mindfulness interventions for mental Health treatment: Systematic review and meta-analysis. *JMIR Mental Health*, 5(3), e10278.
- Shapiro, S., Britton, W. B., & Walsh, R. (2004). An analysis of recent meditation research and suggestions for future directions. *Journal of Meditation Research*, 10, 2–27.



- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology, 62*, 373–386.
- Sherin, J. E., & Nemeroff, C. B. (2011). Post-traumatic stress disorder: The neurobiological impact of psychological trauma. *Dialogues in Clinical Neuroscience, 13*(3), 263–278.
- Shin, L. M., Rauch, S. L., & Pitman, R. K. (2006). Amygdala, medial prefrontal cortex and hippocampal function in PTSD. *Annals of the New York Academy of Sciences, 67–79*.
- Siegel, D. (2007). Mindfulness training and neural integration: Differentiation of distinct streams of awareness and the cultivation of well-being. *Social Cognitive and Affective Neuroscience, 2*, 259–263.
- Siegel, D. J. (2009). Mindful awareness, mindsight and neural integration. *The Humanist Psychologist, 37*, 137–158.
- Siegel, D. (2010). *Mindsight the new science of transformation*. New York: Random House.
- Smith, J. C. (1975). Meditation as psychotherapy: A review of the literature. *Psychological Bulletin, 82*(4), 558.
- Smith, J. D. (2009). *Mindfulness-based stress reduction (MBSR) for women with PTSD surviving domestic violence*. Fielding Graduate University: Unpublished doctoral dissertation.
- Smith, B. W., Ortiz, J. A., Steffen, L. E., Tooley, E. M., Wiggins, K. T., Yeater, E. A., et al. (2011). Mindfulness is associated with fewer PTSD symptoms, depressive symptoms, physical symptoms, and alcohol problems in urban firefighters. *Journal of Consulting and Clinical Psychology, 79*(5), 613.
- Somer, E., & Ataria, Y. (2015). Adverse outcome of continuous traumatic stress: A qualitative inquiry. *International Journal of Stress Management, 22*(3), 287.
- Spijkerman, M. P. J., Pots, W. T. M., & Bohlmeijer, E. T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clinical Psychology Review, 45*, 102–114.
- Stephenson, K. R., Simpson, T. L., Martinez, M. E., & Kearney, D. J. (2017). Changes in mindfulness and posttraumatic stress disorder symptoms among veterans enrolled in mindfulness-based stress reduction. *Journal of Clinical Psychology, 73*(3), 201–217.
- Stevens, G., Eagle, G., Kaminer, D., & Higson-Smith, C. (2013). Continuous traumatic stress: Conceptual conversations in contexts of global conflict, violence and trauma. *Peace and Conflict: Journal of Peace Psychology, 19*(2), 75–84.
- Taylor, B. L., Strauss, C., Cavanagh, K., & Jones, F. (2014). The effectiveness of self-help mindfulness-based cognitive therapy in a student sample: A randomised controlled trial. *Behaviour Research and Therapy, 63*, 63–69.
- Teasdale, J. D., Williams, J. M., Segal, Z. V., Ridgeway, V. A., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology, 68*, 615–623.
- Thompson, R. W., Amkoff, D. B., & Glass, C. R. (2011). Conceptualising mindfulness and acceptance as components of psychological resilience to trauma. *Trauma, Violence & Abuse, 12*(4), 220–235.
- Treadway, M. T., & Lazar, S. W. (2009). *The neurobiology of mindfulness*. In *Clinical handbook of mindfulness* (pp. 45–57). New York, NY: Springer.
- Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., et al. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science, 13*(1), 36–61.
- van Emmerik, A. A., Berings, F., & Lancee, J. (2018). Efficacy of a mindfulness-based Mobile application: A randomized waiting-list controlled trial. *Mindfulness, 9*(1), 187–19.
- Vujanovic, A. A., Niles, B., Pietrefesa, A., Schertz, S. K., & Potter, C. M. (2011). Mindfulness in the treatment of posttraumatic stress disorder among military veterans. *Professional Psychology: Research and Practice, 42*(1), 24–31. <https://doi.org/10.1037/a0022272>.
- Walsh, R., & Shapiro, S. L. (2006). The meeting of meditative disciplines and western psychology: A mutually enriching dialogue. *American Psychologist, 61*(3), 227–239.
- Wheeler, M. S., Arnkoff, D. B., & Glass, C. R. (2017). The neuroscience of mindfulness: How mindfulness alters the brain and facilitates emotion regulation. *Mindfulness, 8*(6), 1471–1487.
- Williams, S. L., Williams, D. R., Stein, D. J., Seedat, S., Jackson, P. B., & Moomal, H. (2007). Multiple traumatic events and psychological distress: The South Africa stress and health study. *Journal of Traumatic Stress, 20*(5), 845–855.