Mindfulness and Compassion – from a neuroscience point of view

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In the last decade there has been a growth of empirical evidence to support mindfulness-based approaches in the mental health setting (Williams & Kuyken, 2012). Following on from the success of the Mindfulness-Based Stress Reduction (MBSR) program to help those with chronic physical health ailments (Grossman et al., 2004), the Mindfulness-Based Cognitive Therapy (MBCT) protocol has been developed and evaluated in individuals with major depressive disorder (Williams & Kuyken, 2012). This protocol seems to be particularly helpful for those with recurrent depression who also have experience of childhood trauma (Williams et al., 2014). The MBCT protocol, with adaptations, has been tried with many other mental health clinical populations, with promising results from these early feasibility and acceptability studies (Hoffman et al., 2010). There is also a suggestion that this training is of benefit to staff (Shapiro et al, 2007) in a way that may secondarily benefit patients (Grepmair et al., 2007).

Within the mindfulness training protocol, participants are encouraged to engage with mental and physical experience on a moment-by-moment basis. This requires attention training, as the mind typically wanders onto other things and especially so when emotions run high. Learning to tolerate emotions, spot mental habits of attachment and avoidance and learning to inhibit chains of thinking and train attention are the key tasks in mindfulness training. These processes recruit a network of brain regions related to attention (including the anterior cingulate cortex and the dorsolateral prefrontal cortex), body awareness (somatosensory cortex, motor and pre-motor cortex) and emotion regulation (right anterior insula and limbic structures including the amygdala; Holzel et al., 2011). Studies on expert meditators who have years of sustained practice suggest that the activation of the default mode network of the brain is reduced (Brewer et al., 2011). This is interpreted as a reduction in the usually habitual mode of self-referential thinking that occurs in the untrained brain.

Although much has been made of the attentional training aspect of mindfulness and meditation practices (and the benefits it brings in relation to focused attention, concentration and the ability to refocus when distracted), alongside this and very much interwoven is training in the ability to be kind to ourselves and our experience – the development of self-compassion. The development of self-compassion is seen as a key step in the ability to genuinely, and sustainably, engage compassionately with others. This is a vital training for those who are routinely working with others who are experiencing great suffering. A recent study (Klimecki et al., 2014) indicates the key difference between an increased empathic versus compassionate mode of responding. In a study with healthy female subjects who had

undergone a short empathy and then subsequently a compassion training protocol, there were distinct patterns of behavioral and neural response to the two types of training. While empathy training increased activation in regions related to emotional experience such as the insula cortex bilaterally (and with associated increases in negative affect) these patterns were reversed after the compassion training. The authors interpret these results as indicating that empathy (feeling along with someone) may not be helpful and lead to burnout, whereas training in compassion reverses these effects. This leaves the individual with the chance to engage more skillfully and in a more sustainable way with the suffering of others.

Studies on expert meditators who specialize in compassion (or '*metta*') practices also indicate that their ability to tolerate suffering is correlated with a different pattern of brain activation (Lutz et al., 2008) compared to non-meditators who have had a short-term *metta* training. In response to negative auditory stimuli, these experts showed a greater reactivity in the temporal parietal junction, insula, somatosensory cortex and amygdala. These findings indicate that with extended practice, it is possible to feel *more* in response to a negative affect situation, yet with the capacity to stay with and tolerate these feelings without reactivity. This means the response to these events is embodied, without intellectual or conceptual elaboration. It is this latter part of the process that is reduced with mindfulness and compassionate mind training. We can still feel, but without the reactivity that is so harmful.

These studies suggest there is much to be learnt from ancient practices that promote mindfulness and compassionate states of mind and invite consideration of how they might be integrated in a meaningful way into our clinical practice. It is suggested that mindfulness starts with the body (Kerr et al, 2013) but the body is also the route to developing genuine, sustainable compassionate states. It is has been suggested that there is an urgent need for these types of mental training within clinical training and practice (Russell, 2014), providing clinicians with the emotional resilience needed to offer genuine care in an increasingly challenging public health setting.

References

Brewer, J. et al. (2011) Meditation experience is associated with differences in default mode network activity and connectivity. Proceedings of the National Academy of Sciences; *published ahead of print November 23, 2011, doi:10.1073/pnas.1112029108*

Hoffman, S. J. et al. (2010) The Effect of Mindfulness-Based Therapy on Anxiety and Depression: A Meta-Analytic Review *Journal of Consulting and Clinical Psychology*. 78(2): 169–183.

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.

Grepmair, L. et al. (2007) Promoting Mindfulness in Psychotherapists in Training Influences the Treatment Results of Their Patients: A Randomized, Double-Blind, Controlled Study. *Psychotherapy and Psychosomatics*; 76:332–338

Grossman, P. et al. (2004) Mindfulness-based stress reduction and health benefits. A meta-analysis. *Journal of Psychosomatic Research 57 (2004) 35–43*

Lutz, A. et al. (2008) Regulation of the neural circuitry of emotion by compassion meditation: Effects of meditative expertise. *PLoS ONE* 3, e1897

Kerr, C. E., Sacchet, M. D., Lazar, S. W., Moore, C. I., & Jones, S. R. (2013). Mindfulness starts with the body: somatosensory attention and top-down modulation of cortical alpha rhythms in mindfulness meditation. *Frontiers in Human Neuroscience*, *7*, 12.

Klimecki, O. M. et al. (2014) Differential pattern of functional brain plasticity after compassion and empathy training. *Social Cognitive Affective Neuroscience*, 9, 873-879

Kuyken, W. et al. (2010) How does mindfulness-based cognitive therapy work? *Behaviour Research and Therapy* 48, 1105-1112.

Russell, T. A. (2014) Body in Mind? The need for an integrative approach to compassion in the NHS. *Journal of Holistic Healthcare.* 11(1) 7-10.

Shapiro, S. et al. (2007) Teaching Self-Care to Caregivers: Effects of Mindfulness-Based Stress Reduction on the Mental Health of Therapists in Training. *Training and Education in Professional Psychology*, 1 (2), 105–115

Williams, M. et al. (2014) Mindfulness-Based Cognitive Therapy for Preventing Relapse in Recurrent Depression: A Randomized Dismantling Trial. *Journal of Consulting and Clinical Psychology*, 82, (2), 275–286.

Williams, M., & Kuyken, W. (2012) Mindfulness-based cognitive therapy: a promising new approach to preventing depressive relapse. *British Journal of Psychiatry*, 200:359-360.

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