

# Breathwork: An Additional Treatment Option for Depression and Anxiety?

Lloyd Lalande · Matthew Bambling ·  
Robert King · Roger Lowe

© Springer Science+Business Media, LLC 2011

**Abstract** Breathwork is an increasingly popular experiential approach to psychotherapy based on the use of a specific breathing technique, however, claims of positive mental health outcomes rely on anecdotal clinical evidence. To ascertain the likely efficacy of breathwork this review clarifies the approach and its theoretical assumptions and examines relevant empirical research relating to breathing inhibition, suppression of inner experience, and possible neurological and physiological effects. Additionally, research into mindfulness-based psychotherapy and yoga breathing-based interventions with comparable features to breathwork are examined. Findings suggest qualified support for the key theoretical assumptions of a three component breathwork model, referred to as Integrative Breathwork Therapy (IBT), and its possible utility in the treatment of anxiety and depression. Further research aimed at exploring specific efficacy of this approach for these disorders may yield a useful

additional treatment option utilising a different process of change to existing treatments.

**Keywords** Anxiety · Breathwork · Depression · Mindfulness · Psychotherapy · Respiration · Somatic

## Introduction

Classed as a mind–body, complementary health practice (Sointu 2006), breathwork has achieved a degree of recognition as a form of psychotherapy in Europe (Sudres et al. 1994) and popular interest is likely to grow with rapidly increasing use of alternative and complementary mental health practices, particularly mind–body approaches for depression and anxiety (Elkins et al. 2005). Despite interest in the approach, breathwork has not been subject to empirical investigation which could guide training and clinical practice, or suggest how client change might occur. Currently, there is no universal agreement as to specific components of the technique or the theory defining the approach. Rather than devaluing untested complementary or alternative approaches to mental health, controlled effectiveness studies should be undertaken to examine the evidence for these practices (Norcross 2000). The one study of breathwork attempted to date (Sudres et al. 1994) examined the effectiveness of a standardized ten session intervention with 12 depressed and anxious patients (DSM III-R). Symptom change was assessed pre and post treatment and at 8-week follow-up with ten out of 12 participants achieving clinically significant improvements ( $p < 0.5$ ), which were maintained at follow-up. Results of this study should be interpreted with caution due to the small sample size, lack of a control condition and no examination of process variables thought important in treatment outcome. However, the study provided preliminary evidence for breathwork.

---

L. Lalande  
School of Psychology, Queensland University of Technology,  
Brisbane, Australia

L. Lalande (✉)  
School of Psychology, Australian Catholic University,  
PO Box 456, Virginia, QLD 4014, Australia  
e-mail: lloyd.lalande@acu.edu.au

M. Bambling  
School of Psychology, Australian Catholic University,  
Brisbane, Australia

R. King  
Department of Psychiatry, School of Medicine,  
University of Queensland, St Lucia, QLD, Australia

R. Lowe  
School of Psychology, Queensland University of Technology,  
Brisbane, QLD, Australia

## The Breathwork Approach

The breathwork technique described here involves therapists guiding clients through an approximately 1 h process involving the ongoing regulation of breathing, relaxation and application of mindfulness, while the client lies comfortably on their back. A series of 10 weekly or fortnightly sessions is the suggested norm. Apart from providing a rationale for the approach and general support, no additional cognitive or behavioural strategies are required.

The technique that most defines breathwork and differentiates it from other relaxation, meditation and yoga exercises is ‘conscious connected breathing.’ This technique involves therapists guiding clients in maintaining throughout the session a continuous uninterrupted breathing rhythm with no pauses between transitions of exhale and inhale, with inhalation being active and involving expansion of the upper chest (Dowling 2000; Minett 2004). The lead author’s experience with breathwork over the last 20 or so years suggests exhalation should be a transition to complete letting go and relaxation of respiratory muscles. Based on the respiration research literature (Bolton et al. 2004; Bradley 2002), this breathing pattern is comparable to a normal, healthy breathing style which features virtually unbroken rhythmicity and the complete release during exhalation of respiratory muscles active during inhalation. This breathing style differs from that of a normal resting state in that clients are encouraged to adopt an inhalation generally of greater depth, emphasising mobilization of the entire chest. Therapist instructions (Lalande 2007) include statements like “Keep your breathing connected—no gaps or pauses—just a continuous rhythm” and “Just let go on the out-breath.”

In addition to guiding clients in maintaining the conscious connected breathing technique described above, therapist support is also provided in maintaining detailed awareness to somatic experience as it unfolds moment-to-moment, and the adoption of an accepting open attitude toward the inner experience taking place. Therapist instructions include, “Focus on the dominate sensation in your body—whatever stands out—study that” and “Whatever is happening right now, just allow it to be there.” Throughout the session clients are also encouraged to relax (Dowling 2000; Minett 2004) by remaining alert to the presence of muscular holding-on (tension) in the inner landscape they are observing and releasing the tension they identify. Clients may become aware of pre-existing tension or tension may develop in the form of tightening-up as a defensive response to emerging somatic experience. Relaxation in this approach does not include muscle contractions, hypnotic suggestions, visualization, or counting with breathing used in other approaches to relaxation (e.g. Bernstein et al. 2000). A therapist instruction would be “Any tension you notice—just let it go.”

Client experience of breathwork can include novel somatic experiences including increased awareness of tension, energy flows and sensations, along with brief occurrences of heightened arousal including increased emotionality, sadness, frustration and fear (observed clinically as tearfulness or restlessness, for example). It is well accepted that breathing, relaxation and meditative practices can create greater subjective physiological awareness (Schwartz and Schwartz 1996; Smith 1988). Autonomic nervous system effects tend towards overall parasympathetic dominance (relaxation). On completion of a session clients generally report a state of mental clarity, profound relaxation and sense of wellbeing. Anecdotal client reports of change as sessions progress include spontaneous cognitive and behavioural insights, improved interpersonal functioning, and sense of, and desire for, increased authenticity.

The existing breathwork literature (e.g. Dowling 2000; Minett 2004) does not explicitly provide a conceptual model of psychopathology. In this paper we are suggesting that psychopathology from a breathwork model perspective involves the suppression of feelings, sensations and emotions experienced as aversive and inhibition of breathing as a central mechanism through which suppression is achieved. The need for ongoing control and defense against awareness of troubling somatic and psychological experience (necessary to maintain a sense of psychological balance) then results in a habitual, abnormal breathing pattern that becomes a more or less permanent feature of physiological functioning. Breathwork, therefore, assumes a link between the defensive adaptation of inhibited breathing, the presence of unintegrated psychosomatic experience, and the development and maintenance of psychopathology. The approach aims to bring rejected somatic experience into conscious awareness through the removal of breathing inhibitions, and then integrate those experiences into the general flow of consciousness by applying detailed somatic awareness, acceptance and relaxation. The empirical basis for this formulation will be presented in the following sections.

### Suppression of Inner Experience and Psychopathology

The suppression of inner experience, which is assumed in breathwork to be detrimental to mental health whether achieved through inhibited breathing or not, has been shown to play a role in the aetiology and persistence of anxiety and depression (Gross 2002; Purdon 1999). Campbell-Sills et al. (2006) also found suppression correlated with poorer recovery from negative affect, increased sympathetic arousal, and decreased parasympathetic responding. The tendency to avoid or control, rather than accept inner experience is suggested as a specific risk

factor in generalised anxiety disorder (Roemer et al. 2005), and has been correlated with diminished positive emotional experiences and life satisfaction, and less frequent positive events on a daily basis (Kashdan et al. 2006). It seems that maintaining the suppression of unwanted thoughts, memories and emotions may also require continuous vigilance to avoid their paradoxical reemergence during post-suppression periods (Campbell-Sills et al. 2006; Dalglish and Yiend 2006; Wegner 1994; Wenzlaff et al. 1988). A breathwork model that aims to improve wellbeing by replacing suppression of aversive inner experience (through inhibition of breathing) with acceptance and integration of inner experience (by teaching a non-defensive, uninhibited breathing style along with openness to experience) seems to be supported by the above research, especially in the area of depression and anxiety.

### Inhibition of Breathing and Psychopathology

Evidence shows that anxiety and expectation related to social and environmental factors leads to the development of inhibited breathing patterns (Fokkema 1999). Additionally, a cognitive orientation toward the environment as unpredictable, uncontrollable, or overwhelming is linked to inhibited breathing characterised by subnormal breathing frequency (Anderson and Chesney 2002). Stressful environments have been found to elicit sustained inhibitory changes to breathing patterns (Anderson 2001) with higher demands on attention producing more inhibition (Denot-Ledunois et al. 1998). Classical conditioning, which has been shown to shape breathing patterns (for a review of influences on breathing, see Shea 1996), may play some role in inhibited breathing developing into a habitual style. As suggest by Anderson and Chesney (2002), in response to the state of hopelessness experienced when facing an uncontrollable environment ‘an inhibited breathing pattern would not be merely a transient response to an acute stressor, but a generalized breathing habit conditioned to the assessment that the world is a difficult or dangerous place.’

Inhibited breathing also effects neurological functioning. Given there is little or no reserve of oxygen in the brain it is very sensitive to any changes in level of oxygen present in the blood or changes to blood flow (Erecinska and Silver 2001). Animal models have demonstrated that a slight deficiency of oxygen reaching brain tissue (mild hypoxia) can result if breathing is inhibited, and while energy production via glucose metabolism may remain unaffected, serotonin synthesis is reduced (Erecinska and Silver 2001; Nishikawa et al. 2005). In humans, conditioned suppression of breathing leads to reduced oxygen and high CO<sub>2</sub> levels in the blood which in turn is associated with a tendency toward increased worry and negative affect

(Dhokalia et al. 1998). Multiple studies of acute depression have demonstrated decreased frontal cortex metabolism and limbic activation, with the severity of depression linked to larger decreases in metabolism (Post 2000).

It has also been suggested that a biological pathway in which elevations in blood pressure and CO<sub>2</sub> levels resulting from strained breathing perpetuate inhibited breathing once it is established (Fokkema 1999). The physiological evidence suggests a pathway by which inhibited breathing patterns might affect brain metabolism and serotonergic neurotransmission and create a feedback loop involving cognitive, physiological and neurological components that increase risk for major depression (Rosa-Neto et al. 2004). Overall, the evidence discussed above suggests the interaction of psychological and biological mechanisms may perpetuate both inhibited breathing and symptoms of depression or anxiety.

### Comparative Psychotherapy Approaches

#### Rhythmic Breathing-Based Yoga Interventions

Two yoga interventions that utilise rhythmic breathing have shown promise in treating depression (for reviews on yoga for depression and anxiety see, da Silva et al. 2009; Pilkington et al. 2005). Shavasana Yoga teaches slow breathing featuring a two second pause after each inhale and one second pause at the end of each exhale, while relaxing flat on the floor with eyes closed (Khumar et al. 1993). Fifty female subjects suffering from severe depression were assigned to either the yoga treatment comprising of 30 min daily practice over 30 days, or a no-treatment control group. Sixty-four percent of the treatment group experienced significant reduction in depression scores (Zung Depression Self-Rating Scale; Zung 1965) while 44% recovered completely. There was no overall change in the control group at treatment end (Khumar et al. 1993). A randomised controlled trial conducted over 4 weeks compared Sudarshan Kriya Yoga with electroconvulsive therapy (ECT) and tricyclic antidepressant medication (imipramine) as an intervention for depression. The yoga intervention includes a number of breathing techniques involving various degrees of control and forcefulness (Brown and Gerbarg 2005) and was practiced for 45 min once daily for 6 days a week over the 4 week trial period, all groups achieved significant improvement on the Beck Depression Inventory (Beck et al. 1961) and the Hamilton Rating Scale for Depression (Hamilton 1960) with no significant differences between treatments (Janakiramaiah et al. 2000). The two approaches above teach different breathing styles yet both show promise as treatments for depression which suggests that a breathwork

intervention that utilises uninhibited rhythmic breathing as a treatment component would be similarly effective.

### Support for Mindfulness as a Component of Breathwork

Fundamental to the breathwork approach under discussion is the sustained self-regulation of attention on breathing and the details of bodily sensations as they arise moment-to-moment along with maintenance of an attitude of acceptance toward inner experience (Dowling 2000; Minett 2004). These are considered key elements that define mindfulness meditation in the psychotherapy literature (Bishop et al. 2004), and components responsible for therapeutic change in Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn 1990). Therefore, research supporting the effectiveness of mindfulness in MBSR and may also suggest some support for the effectiveness of Breathwork.

Both MBSR and breathwork utilise formal mindfulness practice as a key intervention to create therapeutic change, however, in MBSR mindfulness of breathing is a passive observational process while in breathwork the conscious connected breathing technique described earlier is actively adopted with therapist support as a therapeutic tool. Clients complete a breathwork session in about 1 h which is comparable to the formal meditation practice in MBSR, however, breathwork is not generally administered more than once per week.

Mindfulness interventions are steadily amassing considerable empirical evidence suggesting effectiveness (for reviews, see Allen et al. 2006; Baer 2003; Bishop 2002; Hofmann et al. 2010; King 2006). A rigorous meta-analysis (Grossman et al. 2004) assessing MBSR for a variety of mental health problems yielded a medium effect size for positive outcome on all mental health variables ( $d = 0.54$ ) and physical health variables ( $d = 0.53$ ). A more recent meta-analysis (Hofmann et al. 2010) found effect sizes that indicated MBSR and Mindfulness-Based Cognitive Therapy (Segal et al. 2002) are both effective in reducing depression and anxiety symptoms. More specifically, MBSR is effective in the treatment of generalised anxiety disorder, panic disorder and depression (Kabat-Zinn et al. 1992) with treatment effects maintained at 3-year follow-up (Miller et al. 1995). MBSR has also been found to reduce ruminative thinking with reductions in rumination accounting for reductions in depression and anxiety related maladaptive cognitive content and affective symptoms (Ramel et al. 2004). Rumination predicts the onset of depressive disorders, anxiety symptoms and mixed anxiety-depression (Nolen-Hoeksema 2000) and also predicts greater depression and anxiety and longer duration of negative feelings (Leahy 2002).

The mechanisms by which mindfulness meditation brings about change are suggested to include: exposure type processes; relaxation; an increased capacity for emotional regulation and processing; and a changed relationship to ones thoughts, feelings and sensations (Baer 2003; Bishop et al. 2004; Hayes and Feldman 2004; Shapiro et al. 2006). Given the first two of these mechanisms are formally utilised in a standardized breathwork approach and the second two are consistent with anecdotal reports of client experience, and in light of our current understanding of mindfulness practice as an effective component of therapeutic interventions for depression and anxiety, the application of mindfulness in the breathwork approach should also contribute to therapeutic outcomes.

Breathwork, while including mindfulness in the approach is distinctly different in that it uses respiratory regulation. Mindfulness, as described in the psychotherapy literature cited above, does not involve therapist guided, moment-to-moment support in maintaining a continuous cyclic breathing rhythm with active inhalation and complete release of respiratory muscles on exhalation—described as a healthy, natural breathing style in the respiration literature (Bolton et al. 2004; Bradley 2002). In other words, mindfulness does not actively focus on achieving and maintaining an uninhibited breathing pattern on a moment-to-moment basis. The modification of habitual inhibited breathing patterns is not addressed directly in mindfulness. The respiratory regulation component of breathwork not only substantially increases awareness of somatic phenomena, it actually elicits deeply buried somatic experience to which mindfulness can then be applied. Breathwork is not so much a mindfulness-based practice as it is a respiration-based practice that utilizes mindfulness as an essential component in the process of integrating somatic material the respiratory component makes available to conscious awareness.

### Neurological Effects of Meditation and Breathwork

Research into the neurological effects of meditation also suggests therapeutic utility as a component of breathwork. A well established characteristic of meditation is increased alpha and theta activity, with increased alpha activity shown to relate to higher serotonin activation (Anderer et al. 2000; Thorleifsdottir et al. 1989), while Kjaer et al. (2002) found theta activity during meditation related to a 65% increase in dopamine release. During meditation overall cerebral blood flow also increases (Cahn and Polich 2006) which may play a role in these changes. Meditation is thought to modulate behavioural states related to arousal, attention, mood, and motivation at least partly through serotonergic innervation (Mesulam 2000). Additional support for this proposition comes from EEG studies

suggesting meditators are better able to regulate intensity of emotional arousal (Aftanas and Golosheikin 2005). The well established link between meditation and increased alpha and theta brain wave activity suggests another possible pathway by which breathwork might create therapeutic neurological changes.

#### Total Relaxation as a Component of Breathwork

Relaxation techniques are known to alleviate distress, anxiety and depression, increase positive mood states (Jain et al. 2007; Luebbert et al. 2001; Stetter and Kupper 2002), and increase EEG theta brain wave activity, which is associated with reduced central nervous system arousal (Jacobs and Friedman 2004). Relaxation in breathwork is concerned with not only relaxation in a general sense, but also with developing awareness of, and skill in releasing, holding-on at the most subtle levels, especially while experiencing challenging inner experiences. Breathwork aims to develop the cognitive skills of focusing, passivity and receptivity Smith (1988) suggests relaxation techniques promote. Smith (1988) describes *focussing* as ‘the ability to identify, differentiate, maintain attention on, and return attention to simple stimuli for an extended period,’ *passivity* as ‘the ability to stop unnecessary goal-directed and analytic activity’ and *receptivity* as ‘the ability to tolerate and accept experiences that may be uncertain, unfamiliar, or paradoxical.’ This suggests relaxation in breathwork may reduce arousal levels through a repeated exposure-like process, while teaching a relaxation response to provocative inner experience. In addition, it suggests developing a sense of safety with a psychological process characterised by complete letting-go, defencelessness and surrender to experience.

#### Conclusion

There is empirical support for the idea that sustained inhibited breathing patterns can develop in response to stressful environments. Research also suggests inhibited breathing lowers brain oxygen and reduces serotonin synthesis with consequent increase in depressive symptomology. Further, a feedback loop involving cognitive, physiological and neurological components may perpetuate inhibited breathing and symptoms of depression and anxiety. In addition to the encouraging results from the breathwork study by Sudres et al. (1994) noted in the introduction, there is empirical support for yoga breathing-based interventions in treating depression, and meditation-based approaches demonstrate efficacy in the treatment of depression and anxiety. Neurological and behavioural self-regulatory changes associated with meditation are also

related to positive mental health outcomes. This review has identified empirical evidence that suggests support for a standardized breathwork approach based on three core components that together promote somatic integration; the conscious connected breathing pattern, mindfulness, and relaxation. There is qualified support for the key theoretical assumptions of breathwork and its possible utility in the treatment of anxiety and depression. Given no standardized breathwork approach exists for research purposes (e.g. manualization, training) or clinical practice, and to differentiate this breathwork approach from others, and to highlight its aim of integration, this model can be referred to as Integrative Breathwork Therapy (IBT). There is sufficient evidence to conclude a case to undertake efficacy research into IBT particularly relating to depression and anxiety.

#### References

- Aftanas, L. I., & Golosheikin, S. A. (2005). Impact of regular meditation practice on EEG activity at rest and during evoked negative emotions. *International Journal of Neuroscience*, *115*, 893–909.
- Allen, N. B., Blashki, G., & Gullone, E. (2006). Mindfulness-based psychotherapies: A review of conceptual foundations, empirical evidence and practical considerations. *Australian and New Zealand Journal of Psychiatry*, *40*, 285–294.
- Anderer, P., Saletu, B., & Pscual-Marqui, R. D. (2000). Effects of the 5-HT<sub>1A</sub> partial agonist buspirone on regional brain electrical activity in man: A functional neuroimaging study using low-resolution electromagnetic tomography (LORETA). *Psychiatry Research*, *100*, 81–96.
- Anderson, D. E. (2001). Respiratory psychophysiology in hypertension research. *Behavior Modification*, *25*, 606–620.
- Anderson, D. E., & Chesney, M. A. (2002). Gender-specific association of perceived stress and inhibited breathing pattern. *International Journal of Behavioral Medicine*, *9*, 216–227.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, *10*, 125–143.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*, 561–571.
- Bernstein, D. A., Borkovec, T. D., & Hazlett-Stevens, H. (2000). *New directions in progressive relaxation training: A guidebook for helping professionals*. Westport, CT: Praeger Publishers.
- Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine*, *64*, 71–84.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11*, 230–241.
- Bolton, C. F., Chen, R., Wijdicks, E. F. M., & Zifko, U. A. (2004). *Neurology of breathing*. Philadelphia: Butterworth Heinemann.
- Bradley, D. (2002). Patterns of breathing dysfunction in hyperventilation syndrome and breathing pattern disorders. In L. Chaitow, D. Bradley, & C. Gilbert (Eds.), *Multidisciplinary approaches to breathing pattern disorders*. London: Churchill Livingstone.

- Brown, R. P., & Gerbarg, P. L. (2005). Sudarshan kriya yogic breathing in the treatment of stress, anxiety, and depression: Part II—clinical applications and guidelines. *The Journal of Alternative and Complementary Medicine*, *11*(4), 711–717.
- Cahn, B. R., & Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin*, *132*, 180–211.
- Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann, S. G. (2006). Effects of suppression and acceptance on emotional responses of individuals with anxiety and mood disorders. *Behaviour Research and Therapy*, *44*, 1251–1263.
- da Silva, T. L., Ravindran, L. N., & Ravindran, A. V. (2009). Yoga in the treatment of mood and anxiety disorders: A review. *Asian Journal of Psychiatry*, *2*, 6–16.
- Dalgleish, T., & Yiend, J. (2006). The effects of suppressing a negative autobiographical memory on concurrent intrusions and subsequent autobiographical recall in dysphoria. *Journal of Abnormal Psychology*, *115*, 467–473.
- Denot-Ledunois, S., Vardon, G., Perruchet, P., & Gallego, J. (1998). The effect of attentional load on the breathing pattern in children. *International Journal of Psychophysiology*, *29*, 13–21.
- Dhokalia, A., Parsons, D. J., & Anderson, D. E. (1998). Resting end-tidal CO<sub>2</sub> association with age, gender and personality. *Psychosomatic Medicine*, *60*, 33–37.
- Dowling, C. (2000). *Rebirthing and breathwork*. London: Piatkus.
- Elkins, G., Marcus, J., Rajab, M. H., & Durgam, S. (2005). Complementary and alternative therapy use by psychotherapy clients. *Psychotherapy: Theory, Research, Practice, Training*, *42*, 232–235.
- Erecinska, M., & Silver, I. A. (2001). Tissue oxygen tension and brain sensitivity to hypoxia. *Respiration Physiology*, *128*, 263–276.
- Fokkema, D. S. (1999). The psychobiology of strained breathing and its cardiovascular implications: A functional system review. *Psychophysiology*, *36*, 164–175.
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*, 281–291.
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, *57*, 35–43.
- Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry*, *23*, 56–62.
- Hayes, A. M., & Feldman, G. (2004). Clarifying the construct of mindfulness in the context of emotion regulation and the process of change in therapy. *Clinical Psychology: Science and Practice*, *11*, 255–262.
- 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), 169–183.
- Jacobs, G. D., & Friedman, R. (2004). EEG spectral analysis of relaxation techniques. *Applied Psychophysiology and Biofeedback*, *29*, 245–254.
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., et al. (2007). A randomised controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, *33*, 11–21.
- Janakiramaiah, N., Gangadhar, B. N., Naga Venhatesha Murthy, P. J., Harish, M. G., Subbakrishna, D. K., & Vedamurthachar, A. (2000). Antidepressant efficacy of sudarshan kriya yoga (SKY) in melancholia: A randomized comparison with electroconvulsive therapy (ECT) and imipramine. *Journal of Affective Disorders*, *57*, 255–259.
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York: Dell Publishing.
- Kabat-Zinn, J., Massion, A. O., Kristeller, J., Perterson, L. G., Fletcher, K. E., Pbert, L., et al. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *The American Journal of Psychiatry*, *149*, 936–943.
- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy*, *44*, 1301–1320.
- Khumar, A. D., Kaur, P., & Kaur, S. (1993). Effectiveness of shavasana on depression among university students. *Indian Journal of Clinical Psychology*, *20*, 82–87.
- King, R. (2006). Mindfulness-based stress management: Findings from randomized controlled trials. *Psychotherapy in Australia*, *12*, 24–27.
- Kjaer, T. W., Bertelsen, C., Piccini, P., Brooks, D., Alving, J., & Lou, H. C. (2002). Increased dopamine tone during meditation-induced change of consciousness. *Cognitive Brain Research*, *13*, 255–259.
- Lalande, L. (2007). *Integrative breathwork therapy for depression and anxiety: Treatment manual for individual therapy*. Unpublished therapy treatment manual.
- Leahy, R. L. (2002). A model of emotional schemas. *Cognitive and Behavioral Practice*, *9*, 177–190.
- Luebbert, K., Dahme, B., & Hasenbring, M. (2001). The effectiveness of relaxation training in reducing treatment-related symptoms and improving emotional adjustment in acute non-surgical cancer treatment: A meta-analytical review. *Psychooncology*, *10*, 490–502.
- Mesulam, M. M. (2000). Behavioral neuroanatomy. In M. M. Mesulam (Ed.), *Principles of behavioral, cognitive neurology* (2nd ed.). New York: Oxford University Press.
- Miller, J. M., Fletcher, K. E., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implication of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, *17*, 192–200.
- Minett, G. (2004). *Exhale: An overview of breathwork*. Edinburgh: Floris Books.
- Nishikawa, M., Kumakura, Y., Young, S. N., Fiset, P., Vogelzangs, N., Leyton, M., et al. (2005). Increasing blood oxygen increases an index of 5-HT synthesis in human brain as measured using  $\alpha$ -[<sup>11</sup>C]methyl-L-tryptophan and positron emission tomography. *Neurochemistry International*, *47*(8), 556–564.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, *109*, 504–511.
- Norcross, J. C. (2000). Here comes the self-help revolution in mental health. *Psychotherapy*, *37*(4), 370–377.
- Pilkington, K., Kirkwood, G., Rampes, H., & Richardson, J. (2005). Yoga for depression: The research evidence. *Journal of Affective Disorders*, *89*, 13–24.
- Post, R. M. (2000). Neural substrates of psychiatric syndromes. In M. M. Mesulam (Ed.), *Principles of behavioral and cognitive neurology*. New York: Oxford University Press.
- Purdon, C. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy*, *37*, 1029–1054.
- Ramel, W., Goldin, P. R., Carmona, P. E., & McQuaid, J. R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research*, *28*, 433–455.
- Roemer, L., Salters, K., Raffa, S. D., & Orsillo, S. M. (2005). Fear and avoidance of internal experiences in GAD: Preliminary tests of a conceptual model. *Cognitive Therapy and Research*, *29*, 71–88.
- Rosa-Neto, P., Diksic, M., Okazawa, H., Layton, M., Ghadirian, N., Mzengeza, S., et al. (2004). Measurement of brain regional  $\alpha$

- [<sup>11</sup>C]methyl-L-tryptophan trapping as a measure of serotonin synthesis in medication-free patients with major depression. *Archives of General Psychiatry*, *61*, 556–563.
- Schwartz, M. S., & Schwartz, N. M. (1996). Problems with relaxation and biofeedback: Assisted relaxation and guidelines for management. In A. M. S. Schwartz (Ed.), *Biofeedback: A practitioner's guide* (2nd ed.). New York: The Guilford Press.
- Segal, Z. V., Williams, M., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: The Guilford Press.
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, *62*, 373–386.
- Shea, S. A. (1996). Behavioural and arousal-related influences on breathing in humans. *Experimental Physiology*, *81*, 1–26.
- Smith, J. C. (1988). Steps toward a cognitive-behavioral model of relaxation. *Biofeedback and Self-Regulation*, *13*, 307–329.
- Sointu, E. (2006). The search for wellbeing in alternative and complementary health practices. *Sociology of Health & Illness*, *28*, 330–349.
- Stetter, F., & Kupper, S. (2002). Autogenic training: A meta-analysis of clinical outcomes. *Applied Psychophysiology and Biofeedback*, *27*, 45–98.
- Sudres, J. L., Ato, P., Fouraste, R., & Rajaona, E. (1994). Breathwork: A corporal mediation therapy? Evaluation trial and initial reflections. *Psychologie Medicale*, *26*, 1362–1368.
- Thorleifsdottir, B., Bjornsson, J. K., Kjeld, M., & Kristbjarnarson, H. (1989). Effects of L-tryptophan on daytime arousal. *Neuropsychobiology*, *21*, 1–9.
- Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review*, *101*, 34–52.
- Wenzlaff, R. M., Wegner, D. M., & Roper, D. W. (1988). Depression and mental control: The resurgence of unwanted negative thoughts. *Journal of Personality and Social Psychology*, *55*, 882–892.
- Zung, W. (1965). A self-rating depression scale. *Archives of General Psychiatry*, *12*(1), 63–70.