

## Chapter 8

# Neurocognitive Mechanisms of Yoga: Implications for Yoga Therapy

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### **ABSTRACT**

*This chapter combines insights from the neuroscientific research on yoga and meditation with the practical application of yoga therapy. The chapter opens with an overview of neuroscientific concepts related to the practice of yoga and meditation, such as attention, emotional regulation, body awareness, and autonomic regulation. The authors summarise the known effects of yoga and meditation, in relation to these concepts and common mental health disorders. The chapter continues with a case study, a personalised yoga therapy intervention in a client experiencing psychotic symptoms. The intervention is grounded in yoga philosophy, and in the neuroscientific concepts introduced previously. This section is written from the perspective of a yoga therapist and includes practical tips. In the final section, the authors suggest possible directions for future research and implementation of yoga therapy as a complementary treatment in mental healthcare.*

### **INTRODUCTION**

Yoga philosophy is formed around the idea of personal transformation. The ultimate goal of yoga — stilling thoughts and achieving the realisation of self-awareness — can be reached through consistent practice. This idea overlaps with modern neuroscience, which holds that our brain can change in response to experience and training. Yoga and meditation could be seen as a form of mental exercise, that transform the neurocognitive processes underlying our personalities. A large number of empirical studies show the positive effects of yoga and meditation-based interventions on mental health (Goldberg & Tucker,

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2020; Wielgosz et al., 2019). Inspired by this wave of research, yoga and meditation gradually become well-validated approaches in Western mental healthcare.

Yoga practice has many components, and in the broadest sense can be seen as a holistic approach to wellbeing. Yoga traditions, adopted in the West, vary in their focus on different elements of the practice (postures, breathing exercises, relaxation, and meditation). An individual yoga practice develops and changes over time, following one's changing needs. The content of yoga practice, and specific instructions can thus hardly be fixed. As a result, yoga interventions do not rely on standardised practices (Sherman, 2012), and clinical research on yoga employ different protocols. Instead of working with standardised protocols and labels, therapeutic yoga is traditionally individualised and tailored to the person's needs.

Every person can have episodes of anxiety, depression or psychotic dissociation to one degree or another. A yoga therapist needs to see the mental health problems on a spectrum, to place them in the context of one's life events and approach them holistically at many levels of being. It is also essential to understand the neurocognitive mechanisms underlying psychiatric symptoms and map the effects of yoga in terms of cognitive and affective processes. This knowledge may help to choose an optimal approach for a yoga therapy treatment.

In this chapter, we combine insights from the neuroscientific research of yoga and meditation with practical implications for yoga therapy. In the first part, we discuss the fundamental neuroscientific concepts related to the practice of yoga and meditation: attention, emotional regulation, body awareness, and autonomic regulation. We summarise evidence on the neurophysiological effects of yoga from existing clinical research, in relation to common mental health problems. We then present a case study of a personalised yoga therapy intervention in a client experiencing psychotic symptoms. We discuss this case from the perspective of a yoga therapist and show that the intervention has its foundation in the yoga philosophy and the modern neuroscientific concepts. Finally, we discuss future perspectives and directions for the implementation of yoga therapy in mental healthcare.

## **YOGA AND MEDITATION: NEUROCOGNITIVE MECHANISMS AND CLINICAL APPLICATIONS**

### **Meditation and Regulation of Attention**

Modern science considers meditation as a form of mental training that can improve meta-awareness – i.e., the awareness of one's processes of consciousness, including thinking, feeling and perceiving. Meta-awareness is closely related to mindfulness – an internal stance of attention to present moment characterised with curiosity, openness and acceptance. Even though the term *mindfulness* is usually connected to Buddhist meditation tradition, it is also a fundamental element of yoga practice, described in the Yoga Sutras of Patanjali as the state of self-observation, concentration and introspection.

In recent years, an increasing number of research studies has shown that regular mindfulness training can improve self-regulation, stress-resilience and wellbeing. Meditation-based interventions are promoted these days as a way to cultivate a healthy, balanced and compassionate way of living (Singer & Engert, 2018). Protocol-based interventions such as the 8-week mindfulness-based stress reduction (MBSR) program and mindfulness-based cognitive therapy (MBCT) have built a strong reputation in mainstream clinical and educational settings (Singer & Engert, 2018). At the same time, research in

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