

Yoga and PTSD: A Primer on Symptoms and Potential Mechanisms of Change

By Timothy J. Avery

Empirical research into the effects of yoga on posttraumatic stress disorder (PTSD) is limited for multiple reasons. Yoga is a diverse set of skills that includes psychological and physical practices. This diversity makes it difficult to delineate whether yoga or its constituent practices cause change. Similarly, PTSD is a mental health diagnosis containing thousands of possible combinations of symptoms that overlap with other diagnoses, mainly depression and anxiety. The broadness of the PTSD diagnosis contributes to difficulty in studying treatments, as a specific intervention may improve a specific symptom or symptom cluster while not significantly improving measurements of total PTSD symptoms and vice versa. How do we make sense of the existing research on the effects of yoga practice on PTSD?

This article presents an overview of PTSD symptoms and what research does (and does not) tell us about how yoga affects PTSD. First, we consider what PTSD *is*. The PTSD clusters, or sets of related symptoms, as defined in the Diagnostic and Statistical Manual of Mental Health Disorders 5th Edition, are re-experiencing, avoidance, arousal/irritability, and negative changes in thoughts and mood.¹ Studies using yoga and other mind-body interventions have shown some effects on these symptom clusters through proposed cognitive, behavioral, and physiological mechanisms. Yoga is not currently an empirically supported primary treatment for PTSD. To achieve the status of “empirically supported treatment” two independent groups of researchers must demonstrate that yoga—or any potential treatment—contributes to meaningful changes in PTSD symptoms compared to a control condition in an appropriately conducted and randomized sample.² At this time, studies generally suggest the likely benefit and acceptability of yoga as an adjunct therapy.³

Yoga’s Effects on PTSD Symptoms

Re-Experiencing

Re-experiencing includes symptoms such as intrusive thoughts and memories. A distressing memory may demand the attention when the person is reminded of the event, such as while watching news covering similar events; the person experiences a subsequent barrage of thoughts and cannot redirect attention to something else. Even more extreme, someone may experience the sights, sounds, and smells from a previous traumatic event as if it were happening in the current moment (i.e., flashbacks).

How might yoga affect intrusive thoughts and memories? One potential mechanism is through attentional control—the ability to select what we mentally process or think about.⁴ An intrusive thought is by definition not purposefully selected for mental processing. This experience is like a severe version of the “monkey mind” often referenced in yoga classes, bringing up extremely threatening thoughts (e.g., no place is safe, something terrible is

going to happen to me today) instead of the usual mental chatter. Therefore, it is important to develop the ability to select what to think about in response to an intrusive thought.

In a controlled study with elderly subjects, those participating in yoga demonstrated better performance in set shifting, a particular type of attentional control.⁵ Counter to these findings, at least one study suggests that improvements in attentional control following yoga are due primarily to reduced anxiety and not to any newly gained ability to control attention.⁶ The answer has not yet been confirmed despite multiple studies on yoga’s potential cognitive effects.⁷

The diversity of yoga practices may be particularly well suited to benefit those with the equally diverse and complicated combinations of PTSD symptoms.

These findings are a good example of how difficult it is to clarify mechanisms of change in yoga. That is, does yoga affect the symptom directly, such as by improving attentional control, or indirectly, such as by decreasing anxiety which in turn helps a person better control her or his attention? Some studies suggest observable brain changes account for improvements in re-experiencing symptoms. For instance, mindfulness-based stress reduction (MBSR) is a treatment combining yoga practices of postures and meditation with psychoeducation. MBSR is associated with positive changes in brain regions implicated in PTSD, namely the anterior cingulate cortex, inferior parietal lobule, insula, and precuneus.⁸

Avoidance

Avoidance includes PTSD sufferers avoiding emotions, people, and/or places that remind them of the trauma. A trauma is a deeply distressing experience in which aspects of the event and one’s reaction to it are beyond a person’s immediate control. Psychotherapy, accordingly, often explores perceptions of control in response to traumatic events. Any situation in which a person does not perceive having control may remind him or her of the trauma. Common examples include crowds or sharing a space with someone who is behind one’s back or out of sight. Fostering the opposite of avoidance is therefore useful.

Psychological flexibility, the capacity to persist in the face of stressors and in the service of long-term valued goals, is one attribute that represents the opposite of experiential avoidance.⁹ When participants in Kripalu Yoga were compared to a non-yoga group that completed assessments in a group setting, the outcome data did not predict improvements in PTSD or psychological flexibility. Both groups experienced improvement in PTSD, so it could not be determined that yoga *caused* improvement. However, only within the yoga group were improvements in PTSD associated with increases in psychological flexibility. The authors hypothesized that the increase in psychological flexibility may result from guidance in yoga class regarding how to encounter aversive emotions and sensations.¹⁰

More yoga participants reported coping better with their PTSD compared to the control group. This is another challenge in interpreting yoga research: even in the absence of objective improvement, those practicing yoga may *perceive* improvement.

Arousal/Irritability

Irritability, more comprehensively referred to as hyperarousal, includes symptoms such as anger and increased startle response. A yoga study consisting primarily of yogic breath meditation—*sudarshan kriya*, or “power breath”—demonstrated decreases in PTSD symptoms when compared to a waitlist control group.¹¹ Participation in this yoga group was also associated particularly with decreased hyperarousal and re-experiencing symptoms. Participants reported re-experiencing traumatic memories while in a meditation-induced relaxed state and were not as strongly affected by these traumatic memories after the intervention. Interestingly, the participants were less aroused in response to re-experiencing, as opposed to the above-described use of controlled attention to choose one’s thoughts in response to re-experiencing. However, there was no significant improvement in avoidance. The active-breath meditation in this



case may work through changes in physiological arousal in addition to the effects on cognitive and behavioral mechanisms shown in other yoga studies. These hyperarousal changes are reinforced by the Kripalu Yoga study above, as those researchers also found that hyperarousal decreased only for the yoga participants.⁷ A larger randomized controlled trial is underway comparing *sudarshan kriya* to cognitive processing therapy, one of the empirically supported treatments for PTSD.¹²

Physiological changes likely account for at least some of these improvements in hyperarousal. One controlled study showed that improvements in mood and anxiety from a 12-week yoga series were associated with increases in the neurotransmitter gamma-aminobutyric acid (GABA).¹³ Decreased GABA is associated with stress and underactivity of the parasympathetic nervous system; increases in GABA are associated with adaptive stimulation of the vagus nerve, which regulates physiological states. Researchers theorize this change

in GABA accounts for some of the therapeutic effects of yoga on PTSD symptoms.¹⁴

Negative Thoughts and Mood

Finally, negative changes in thoughts and mood include such complaints as persistent negative emotions, difficulty experiencing positive emotions, and self-judgment. Yoga may improve participants’ ability to permit their own emotions. The controlled Kripalu study above showed that when compared to participants who underwent assessments and no yoga, yoga participants with posttraumatic stress symptoms had decreased expressive suppression. Expressive suppression is a presumed inefficient emotion regulation strategy in which one inhibits emotion-expressive behavior while emotionally aroused.⁷ In other words, the person “holds back” feelings as the feelings become stronger. If yoga decreases emotional suppression, as observed in this study, those with PTSD symptoms may benefit from yoga through more adaptive emotional responding. In terms of self-judgment, a pilot study for women with posttraumatic stress symptoms showed decreased self-judgment was associated with iRest yoga nidra.¹⁵

Each study discussed here included a different yoga practice. Overall they do not confirm that yoga is more effective for the treatment of PTSD compared to current empirically supported treatments. Furthermore, improvements in PTSD associated with yoga are attributed to several different mechanisms, although some have been demonstrated across multiple studies (e.g., decreased hyperarousal and improved attentional control). People tend to enjoy participating in yoga and perceive improvements in PTSD even if symptom improvements cannot be confirmed to be a result of yoga; they continue or even *increase* practice of yoga after the studies are completed.^{9,16}

Future Directions

Research findings, while limited, suggest yoga supports improved mental and physical functioning that directly and indirectly supports healing. This makes sense given that yoga practice is taught with intention to affect a person at psychological, spiritual, and physiological levels. The diversity of yoga practices may be particularly well suited to benefit those with the equally diverse and complicated combinations of PTSD symptoms. Additional research is required to understand the effects of yoga on those who experience PTSD. However, yoga therapists may leverage lessons from the approach to participants demonstrated in scientific studies. For instance, studies approved by research institutions respect participants’ autonomy and are purposefully designed to minimize potential

adverse effects and thus reveal any changes due to the yoga interventions.

What might all this mean for yoga therapy? Greater scientific understanding of yoga's effects on PTSD and mechanisms of change will support informed healthcare provider referrals and enable more purposeful incorporation of yoga into treatment and wellness plans. Furthermore, yoga therapists may approach clients not with the aim to "treat" PTSD but rather to share yoga to enable the practice to reveal its inherent benefits. **YTT**

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