

Relaxation Techniques for Trauma

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ABSTRACT

Physiological symptoms of posttraumatic stress disorder (PTSD) manifest as increased arousal and reactivity seen as anger outburst, irritability, reckless behavior with no concern for consequences, hypervigilance, sleep disturbance, and problems with focus (American Psychiatric Association, 2013). In seeking the most beneficial treatment for PTSD, consideration must be given to the anxiety response. Relaxation techniques are shown to help address the physiological manifestations of prolonged stress. The techniques addressed by the authors in this article include mindfulness, deep breathing, yoga, and meditation. By utilizing these techniques traditional therapies can be complemented. In addition, those who are averse to the traditional evidence-based practices or for those who have tried traditional therapies without success; these alternative interventions may assist in lessening physiological manifestations of PTSD. Future research studies assessing the benefits of these treatment modalities are warranted to provide empirical evidence to support the efficacy of these treatments.

KEYWORDS

Posttraumatic stress disorder; treatment; physiological stress responses; relaxation techniques; mindfulness; meditation; yoga

According to the American Psychiatric Association (2013) posttraumatic stress disorder (PTSD) symptoms develop after the exposure to a traumatic event(s). Exposure includes directly experiencing, witnessing, or hearing about the traumatic event. Not all who have had this type of exposure will develop a trauma-related disorder. An individual's life experience and personal resilience may determine the impact the traumatic event will have (van der Kolk, 2014). For those who do develop ongoing trauma-related symptoms, professional services may be warranted.

The *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. (DSM 5) states a diagnosis of PTSD must meet specific criteria beyond the experiencing of a traumatic event(s). Psychological aspects include intrusive symptoms of recurrent, involuntary distressing memories, recurrent distressing dreams about the event, dissociative reactions, and prolonged psychological reactions to internal and external cues which may signify the event, along with avoidance of any memories or places which may remind them of the event, mood disturbances, and negative cognitive distortions involving the event. Physiological symptoms manifest as increased arousal and reactivity seen as anger outbursts, irritability, reckless behavior with no concern for consequences, hypervigilance, sleep disturbance, and problems with focus (American Psychiatric Association, 2013). In seeking the most beneficial treatment for PTSD, consideration must be given to the anxiety response, understanding what is happening in the brain of someone struggling with PTSD.

The brain is responsible for both creating and eliminating the anxiety response (Wehrenberg & Prinz, 2007). A detailed explanation of the stress response is beyond the scope of this article. A simplified version of the basic response involves the sympathetic nervous system (SNS) and the endocrine reactions. In an effort to restore homeostasis these systems will attempt to increase energy sources and impede body functions not immediately necessary to address the perceived threat. This response manifests as increased heart rate, blood pressure, glucose levels, as well as inhibited digestion,

reproduction processes, immune response, and pain perception. The individual will experience increased arousal and hypervigilance (Conrad, 2012). The stress response is a physiological response which is mediated by environmental, psychological, and behavioral factors. The brain seeks to maintain a state of homeostasis, and has systems in place to achieve this in normal stress situations. In an attempt to achieve physiological homeostasis when the stress response is beyond the normal range for an extended duration, networks of mediators are employed, such as behavioral, sympathetic, and neuroendocrine factors (Conrad, 2012). The use of relaxation techniques may be beneficial in mediating this continued stress response.

van der Kolk (2002) alleges treatment for PTSD needs to address sensory reminders, and assist the individual in experiencing physical mastery over the triggers that have been inciting trauma responses. If the individual is aware of their triggers and can be prepared to respond to these, the use of relaxation techniques may assist in managing an over-reactive stress response. These techniques may be used as a gateway to prepare individuals with PTSD to participate in other evidence-based forms of treatment as hypervigilance decreases and focus increases. Improved sleep patterns, another potential benefit of relaxation techniques, has far reaching affects. Better quality of sleep improves the ability to fall and stay asleep. Sleep patterns following yoga practice have been found to decrease symptoms of depression and reduce pain syndromes (Field, 2011). Meditation, yoga, progressive muscle relaxation, deep breathing, and guided imagery are relaxation techniques used in various health settings. Practicing these techniques requires the client to be mindful, or in the moment, producing a calm which suppresses the stress response (Shah, Klainin-Yobas, Torres, & Kannusamy, 2014). Beyond the physiological response, another benefit of relaxation techniques includes regulation of emotions through increased activation of the limbic system. The limbic system affects both emotions and memory (Feinstein et al., 2010; Hoch et al., 2012; Suvak & Barrrt, 2011). This suggests improved emotional regulation, behaviors, and memory through the practice of relaxation techniques.

Relaxation techniques

In viewing prolonged stress as a physical problem and not simply a mental one, it becomes increasingly important to address the physiological manifestations of stress by utilizing relaxation techniques. Relaxation techniques can assist in undoing the body's stress response, reducing muscle tension, decreasing the heart rate and blood pressure, and even slow breathing (Shah et al. 2014). Several relaxation techniques show promise in their ability to address the physiological symptoms in those who suffer from prolonged stress, such as mindfulness, deep breathing, yoga, guided imagery, and meditation. Incorporating these techniques into therapy, or in using them on their own, may prove to be beneficial in reducing some symptoms of stress and anxiety and may provide valuable coping skills to those who have a difficult time managing their symptoms. In addition, these techniques may provide another avenue for symptom relief for those who are resistant to medication and/or exposure-based therapies.

Mindfulness

People often have a tendency to rush through their lives without paying attention to what is going on around them. Preoccupied with thoughts of the future or past events, seemingly small details of the present do not garner attention. Many people feel as if they are running on autopilot. They may miss details and often put little thought into their current actions. Is there value in turning our attention back to the present moment? Mindfulness attempts to accomplish just that. The word mindfulness is derived from the Pali word, *sati* which means awareness, attention, and remembering and is defined as "awareness of present experience with acceptance" (Germer, Siegel, & Fulton, 2005). Mindfulness is the process whereby a person pays active attention to the present, observing the thoughts and feelings they are currently experiencing. The goal is not to change what is observed but rather to accept what is observed without labeling it as good or bad. Mindfulness is not a new concept, rather it is an ancient one

with roots in Buddhism. It is a concept which has seen renewed interest, especially in the area of psychotherapy. Mindfulness has moved from the practice of yogi's and Buddhists and into modern day psychotherapy. Mindfulness is utilized in current approaches such as dialectical behavior therapy (DBT), mindfulness-based stress reduction (MBSR), and acceptance and commitment therapy (Davis & Hayes, 2011). Studies on mindfulness are gathering increasing evidence showing it is effective in improving emotional regulation and decreasing negative affect.

In a study examining the effect of mindfulness meditation, Chambers, Lo, and Allen (2008) recruited a total of 40 study participants, all whom had applied to a 10-day meditation course. The study group consisted of 9 women and 11 men between the ages of 21–57. The control group, who were placed on a wait list for the 10-day meditation course consisted of 11 women and 9 men between the ages of 22–63. There were no significant differences in the groups in terms of education, gender, or age. The study group was given five self-report inventories: the Mindful Attention Awareness Scale (MAAS) which examines frequency and strength of mindfulness, the Ruminative Responses Scale (RRS), a subscale of the Response Styles Questionnaire (RSQ) which measured ruminative tendencies, the Beck Depression Inventory (BDI) which measures symptoms of dysphoria, the Beck Anxiety Inventory (BAI) which measures anxiety, and the Positive and Negative Affect Schedule (PANAS) which measures current mood. In addition, the study group was given two performance measures: the Digit Span Backward (DSB) subscale of the Wechsler Adult Intelligence Scale, 3rd ed. (W AID III) which examines working memory, and the Internal Switching Task (IST) which measures reaction time. All measures were given as a baseline measure, immediately following the 10-day mindfulness meditation course and again between 7–10 days following the end of the course (Chambers, Lo, & Allen, 2008). Baseline scores for both the study group and control group were taken prior to the beginning of the 10-day course.

Significant differences were found in the scores on the MAAS and BDI with the study group showing higher levels of depressive symptoms and lower levels of trait mindfulness than the control group. In comparing baseline scores to the immediate post-intervention scores, the study group showed significant improvement in scores on the MAAS, RRS, BDI, and PANAS measure while the control group showed no significant difference. In looking at the two performance measures, the mindfulness group showed significant improvement on both the DSB and IST measures while the control group did not. Although this study was limited by its size, the findings were consistent with other research on mindfulness, showing significant improvement for the study group on self-report measures of increased mindfulness skills, reduced depressive symptoms, reduced negative affect, decreased reflective rumination, and some improvement in cognitive function. To a lesser degree, the study group also showed some improvement in the self-report of anxiety symptoms (Chambers, Lo, & Allen, 2008). In addition to the benefits identified in this study, a number of potential benefits for using mindfulness have emerged.

Davis and Hayes (2011) reviewed several studies on the use of mindfulness and found evidence on improved emotional regulation, decreased reactivity, and increased response flexibility, interpersonal benefits such as relationship satisfaction, the ability to communicate emotion, improved response to stress, and improved empathy. In addition, the practice of mindfulness has been shown to enhance function of the middle prefrontal lobe which improves intuition, fear modulation, self-insight, and morality. Neuroplasticity and improved immune functioning are also attributed to the practice of mindfulness (Davis & Hayes, 2011). All of these benefits suggest the use of this technique for those suffering with PTSD.

Mindfulness may be key to the treatment of anxiety and stress disorders, such as PTSD, because it directly addresses avoidance. Avoidance symptoms, particularly avoidance of internal stimuli, is highly predictive of severe and prolonged PTSD symptoms and contributes to psychological inflexibility. If a person is constantly avoiding internal stimuli, they cannot be fully aware of the present. This can cause expressive suppression and poor emotional regulation (Dick, Niles, Street, DiMartino, & Mitchell, 2014). By forcing oneself to be in the present moment and attending to internal stimuli, avoidance cannot be maintained.

Deep breathing

Deep breathing is another technique that can be utilized for relaxation. This breathing, known as pranayama, is intentional control of the breath, consciously inhaling, retaining, and exhaling the breath slowly and deeply. This breathing technique has been shown to increase production of melatonin which aids in a feeling of relaxation. Improvements in autonomic functioning are seen with long-term practice of pranayama; parasympathetic activity increases and sympathetic dominance decreases. Effects of deep breathing can even be seen short-term with decreased heart rate and blood pressure and an increase in theta waves which indicate a parasympathetic state (Jerath, Edry, Barnes, & Jerath, 2006; van der Kolk, 2006). This would suggest a calm state.

In a study by Busch and colleagues (2012), relaxing deep and slow breathing were compared to attentive deep and slow breathing to determine if the effects seen in the use of deep breathing were simply from the respiration or the relaxation. Sixteen subjects were used for this study and all were given two intervention with a period of 6 months between interventions. The first intervention used attentive deep and slow breathing (aDSB) while the second used relaxing deep and slow breathing (rDSB). During the aDSB intervention, subjects were asked to follow a respiratory feedback task which required they have a high degree of concentration and focused attention. The rDSB intervention asked subjects to relax during the breathing training. Each participant was measured on pain perception, autonomic activity, and mood prior to the start of the intervention and after the conclusion of the intervention. Each intervention lasted 6 weeks and subjects were instructed not to practice the techniques at home and were not permitted to participate in any breathing training in the 6 months between interventions. A thermal sensory testing device was used to measure pain thresholds. A skin conductance level was taken to measure sympathetic activity. Finally, mood was measured via self-report using a Profile of Mood States (POMS). There was a significant increase in pain thresholds found for the rDSB intervention while there was no difference found for the aDSB interventions for pain thresholds. The rDSB intervention showed a statistically significant reduction in sympathetic activity while the aDSB did not see any reduction. There were no significant differences between the interventions for measures of mood (Busch et al. 2012). This study, though limited due to small sample size and lack of a control group, suggests the relaxation element of deep breathing is vital to addressing many stress symptoms, such as reducing sympathetic activity and pain.

Yoga

Increasing in popularity as an alternative therapy technique for addressing the physiological responses of stress, yoga is gaining the attention of clinicians and researchers. Combining mindfulness and deep breathing with the addition of movements and sustained poses, the research on yoga suggests the practice can reduce hyperarousal, improve sleep, decrease stress, reduce expressive suppression, reduce feelings of depression, reduce cortisol levels, balance reactivity of endocrine stress response, lower heart rate and blood pressure, lower oxygen consumption, and increase vagal activity (Solomon & Heide, 2005).

In a study conducted by Thirthallo et al. (2013), serum cortisol levels were measured in subjects with depression. In addition, the subjects were given the Hamilton Depression Rating Scale (HDRS). All measures were given at baseline and at 3 months. The subjects were split into 3 groups: medication only, yoga with medication, and a yoga only group. There was also a healthy comparison group which had serum cortisol measures once. Those in the medication only group and the yoga plus medication group were given the medication prescribed by their psychiatrist, therefore the type and dosage of medication was not consistent between participants. The yoga only and the yoga plus medication groups were taught yoga over a month long period and it was practiced at home daily for three months. At the conclusion of the study, all participants showed lower levels of cortisol but both yoga groups showed a significantly greater reduction than the medication only group. In addition, when the yoga

only group is compared to the yoga plus medication group, the yoga only group showed a greater reduction in cortisol. In looking in the HDRS, the greatest reduction was seen in the yoga only group. The difference in outcomes between the yoga only and yoga plus medication group may be attributed to increased cortisol levels caused by some antidepressant medications (Thirthallo et al. 2013). Further research is warranted to determine the possible influence of increased cortisol levels on these outcomes.

In an attempt to study the efficacy of yoga as an adjunctive therapy for PTSD, Staples, Hamilton, and Uddo recruited female veterans with a clinical diagnosis of PTSD. Participants completed a twice weekly hour-long yoga intervention which was developed and taught by instructors certified from the Krishnamacharya Healing and Yoga Foundation (KHYF). This style of yoga focuses on linking breathing to movements and self-awareness through a therapeutic approach. Participants were given the PTSD checklist – military version (PCL-M), Pittsburg Sleep Quality Index (PSQI), State-Trait Anger Expression Inventory-2 (STAXI-2), and Outcome Questionnaire 45.2 (OQ-45.2) at baseline and post intervention. A significant reduction in hyperarousal symptoms and improvement in daytime dysfunction was seen in participants post intervention. Other measures were not found to be statistically significant (Staples, Hamilton, & Uddo, 2013). Reductions in hyperarousal and improvement in daytime functioning is an important consideration for treatment.

Thirty-eight women were recruited in a randomized controlled trial comparing yoga to an assessment control group on subjects with full or subthreshold PTSD, measured by the PTSD Symptom Scale-Interview (PSS-I). Nine participants were veterans and 29 were civilians. Participants were randomly assigned to either the yoga intervention group or the assessment only group. The yoga group attended 12 sessions of Hatha yoga, either once a week for 12 weeks or twice a week for six weeks. Each session lasted 75 minutes and was taught by a 200-hour National Yoga Alliance-certified instructor. The classes emphasized a connection between the mind and body and focused on mindfulness, being present in the moment, and remaining non-judgmental in self-observation. The control group participated in 12 weekly assessment sessions and incorporated a theme related to Dialectical Behavior Therapy, such as mindfulness, regulation of emotions, interpersonal effectiveness, and distress intolerance. Measures for both groups was taken at baseline, post intervention, and as a 1-month follow-up using the PSS-I, PCL-C (the PTSD Checklist-Civilian), and ERQ (Emotional Regulation Questionnaire). Though the study was limited by the small sample size and discrepancies in group with regards to previous yoga experience, veteran status, and education, the findings do suggest further research is warranted. While both groups showed a significant reduction in PTSD symptoms post intervention with no significant difference between the two, expressive suppression decreased significantly for the yoga group but not the control group. At follow-up, the yoga group showed increases in psychological flexibility which was associated with PCL scores, suggesting the changes in PTSD symptoms were related to psychological flexibility. This was not seen in the control group (Dick, Niles, Street, DiMartino, & Mitchell, 2014). The implications of the effect on psychological flexibility further support the benefits of yoga including mindfulness as a part of treatment for PTSD.

Combining mindfulness and deep breathing, yoga also incorporates physical activity which is linked to increases in dopamine and serotonin, which increase positive emotion. This combination is also shown to have a positive effect on brain function, cognitive processing, and cardiorespiratory functioning. While chronic stress alters secretion of cortisol, epinephrine, and norepinephrine, and is associated with hyperarousal, yoga can help to balance this by activating the parasympathetic nervous system (Salmon, Lush, Joblonski, & Sephton, 2008). The research on how yoga effects those with chronic stress is compelling but further research incorporating larger samples and control groups is still needed. However, the current literature suggests a connection between the practice of yoga and a reduction in stress symptoms. The combination of body movement and breathing requires focused attention. The deep breathing and focus on relaxation lowers oxygen consumption, heart rate, and blood pressure. This combination of activities has also shown a correlation to balancing the endocrine stress response and increasing vagal activity along with lowering serum cortisol levels (Salmon et al.,

2008). Increased cortisol levels and vagal tone are related to improved emotion states (Porges, Doussard-Roosevelt, & Maiti, 1994). This would suggest improved mood and the potential for improved emotional regulation.

Meditation

Meditation is another ancient practice that has become the focus of much attention in recent years. Meditation can be a spiritual practice or a secular one. It is often described as a way to gain greater mental focus or greater awareness, either of ones' own mind or of a higher power. There are different techniques for obtaining this awareness, but all strive to accomplish the same end. By creating this greater awareness of the mind, of ones' self, or of spirituality, practitioners of meditation claim to have the ability to help regulate the symptoms of stress (Lang et al., 2012). Meditation in several forms is finding its way into clinical practice for those looking for alternative treatments for symptoms of prolonged stress. Limited empirical evidence for the efficacy of meditation as treatment exists presently, but preliminary findings do support further research.

The benefits of mindfulness have been explored previously. The practice of mindfulness can be done without formal meditation by simply becoming aware and accepting of surroundings, thoughts, and feelings in everyday life. However, mindfulness can also be practiced in more formal meditation. The same concepts apply with practicing mindfulness meditation. The practitioner will pay attention to the present moment, their surroundings, their thoughts, their feelings, and will accept these without judgment. The attention of someone who is dealing with symptoms of PTSD are then forced to focus on the present rather than ruminating on the past or focusing their attention only on certain stimuli. Repeated practice may assist with attention control (Lang et al., 2012). By approaching present stimuli with a focus on non-judgment, the practitioner of mindfulness meditation may develop the ability to accept anxiety for what it is without fear of the emotion.

Mantra meditation is used to bring peace and relaxation through intense focus. The practitioner of this type of meditation will focus their attention on a word or phrase which is repeated, often silently, in order to heighten awareness or to transcend thought. There are slight variations in practice within mantra meditation, one of which includes progressive muscle relaxation while repeating the word or phrase object (Lang et al., 2012). Another variation is silent mantra meditation.

Practitioners of silent mantra meditation, who had less than two years of practice, were studied using functional magnetic resonance imaging while performing meditation. Eight subjects participated in the study, 5 women and 3 men. Their mean age was 35 with a mean of 14 months of practicing meditation. The study was conducted in an on-off clock design whereas the subjects were told to meditate using a mantra and then to silently repeat the phrase "table and chairs" which was chosen as a natural phrase that would be unlikely to evoke an emotional response. Both the mediation and the neutral phrase were done in 2 minute increments, of blocks, with a total of 4 each for 8 blocks. During this cycle of meditation and neutral repetition, the participants were scanned using the fMRI. The participants were found to show significant activation in the bilateral hippocampi during their silent mantra meditation but not with the neutral phrase repetition block. It is known that the hippocampus plays a role in memories though the exact connection between mantra meditation and the activation of the hippocampus is not known at this time. This study also showed significant activation in the middle cingulate cortex and precentral cortex during the silent mantra meditation, both of which are involved in motor control which could indicate heightened awareness of body sensations. While these areas of activation were not seen when the participants were asked to repeat the neutral phrase, the bilateral temporal lobe and right frontal lobe, which are linked to language function, were found to be activated during this block (Engström, Pihlsgård, Lundberg, & Söderfeldt, 2010). An increase in activation may assist in improved communication skills.

In a study conducted by Bormann, Hurst, and Kelly (2013), a Mantram Repetition Program (MRP) was used with 65 veterans with PTSD within the Department of Veterans Affairs. All participants were outpatient and attended 6 weekly 90-minute group sessions which discussed choosing a mantram,

slowing thoughts and behaviors, and developing emotional regulation and attention. Participants were measured using blinded CAPS and self-report in an initial randomized clinical trial. Researchers contacted participants 3 months following the final group session and were asked if they had used the mantram to manage PTSD symptoms and if they used the mantram in any other situation. Following the interviews, 11 categories of triggers were identified with social interactions being the largest triggering category followed by driving. Categories of ways the participants managed their triggers were created and utilization of their mantram effectively accounted for 80% of all incidents. Ninety percent of all participants indicated they had used their mantram effectively with the majority using it to aid in relaxation (Bormann et al., 2013). These high percentages suggest potential benefits for using mantram to manage symptoms of PTSD.

In another study exploring meditation, Chinese undergraduate students were placed in either a control group or an experimental group which utilized integrative body–mind training (IBMT). IBMT focuses on restful alertness and awareness of the breath, the body, and external stimuli and requires a balance of focused attention and relaxation and uses the assistance of a coach to guide the participant. The experimental group followed the instruction with 5 days of group practice, while being guided by the coach to achieve balance through breathing and mental imagery for 20 minutes per day. Measures for both the experimental group and control group were taken one week prior to the intervention and immediately following the intervention. The Profile of Mood States (POMS) and the Attention Network Test (ANT) were among the measures given. At the pre-test, there were no statistically significant differences between the two groups. Executive network scores improved significantly at post-test for the experimental group but not the control group. The experimental group also showed significant improvement post-test for anger–hostility, depression–dejection, tension–anxiety, vigor–activity, and fatigue–inertia whereas the control group did not. This suggests the IBMT intervention heightened positive mood while decreasing negative. Cortisol levels were also measured in both groups. Participants in both groups were given a difficult arithmetic challenge and both groups showed increased levels of cortisol. The experimental group was then given an additional 20-minute session on IBMT and was found to have significantly reduced levels of cortisol post intervention (Tang et al., 2007). This suggests that even very brief meditation intervention can have significant effect on mood and stress symptoms.

Meditation, though used for thousands of years for heightened awareness and relaxation, is just beginning to find its way into clinical research regarding its efficacy in the treatment of prolonged stress. The initial findings of this research suggest there may be a correlation between the practice of meditation and the ability to control symptoms of prolonged stress. Relaxation techniques are shown to help ease the physiological symptoms of stress and further study on the use of meditation as treatment for those who suffer with symptoms of prolonged stress is needed to provide empirical evidence of its effectiveness.

Conclusion

Relaxation techniques are shown to help address the physiological manifestations of prolonged stress. By utilizing mindfulness, deep breathing, yoga, and meditation, and by incorporating these techniques into clinical practice, traditional therapies can be complemented. In addition, these alternative therapies can be used in place of traditional therapies for those who are averse to the traditional evidence-based practices or for those whom have tried traditional therapies without success. Continuing research into these treatment modalities could serve to provide empirical evidence to support the efficacy of these treatments.

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