

Application of Yoga in Residential Treatment of Traumatized Youth

Journal of the American Psychiatric Nurses Association
17(6) 431–444
© The Author(s) 2011
Reprints and permission: <http://www.sagepub.com/journalsPermissions.nav>
DOI: 10.1177/1078390311418359
<http://jap.sagepub.com>



Joseph Spinazzola¹, Alison M. Rhodes², David Emerson³,
Ellen Earle⁴, and Kathryn Monroe⁵

Abstract

BACKGROUND: The Trauma Center at Justice Resource Institute has adapted a form of Hatha yoga into a trauma-sensitive adjunctive component of intervention for use with complexly traumatized individuals exhibiting chronic affective and somatic dysregulation and associated behavioral, functioning, and health complaints. **OBJECTIVES:** This article explores the use of yoga with traumatized youth (aged 12–21 years) in residential treatment. **DESIGN:** A review of the literature on the somatic impact of trauma exposure provides a rationale for the use of yoga with this population and highlights an emerging evidence base in support of this practice. Case vignettes illustrate the integration of structured, gentle yoga practices into residential programming for youth with severe emotional and behavioral problems. **RESULTS:** Anecdotal data and clinical observation underscore the promise of yoga as a viable approach to build self-regulatory capacity of traumatized youth. **Conclusions:** Future directions in the development and evaluation of trauma-informed yoga practices for youth are discussed.

Keywords

trauma, yoga, adolescents, residential treatment, self-regulation

Traumatic exposure is associated with a range of negative sequelae affecting both mental and physical health (American Psychiatric Association, 2000; Anda et al., 2007; Corso, Edwards, Fang, & Mercy, 2008; Felitti et al., 1998; van der Kolk, 1994; van der Kolk, McFarlane, & Weisaeth, 1996). Despite the growing recognition of the inextricable connections between the body and mind in traumatic stress disorders (see, for instance, Bremner, 2002; Glod & McEnany, 1995; Hartman & Burgess, 1993; Kreidler & Kurzawa, 2009; Scaer, 2001), few treatments attempt to address both somatic and psychological symptoms (Nemeroff, 2004; Ogden, Minton, & Pain, 2006). The majority of evidence-based treatments for posttraumatic stress disorder (PTSD) adhere to narrative, memory-processing, or cognitive-reframing approaches that deemphasize the role of the body in the recovery process (Bradley, Greene, Russ, Dutra, & Westen, 2005; Foa, Keane, & Friedman, 2000). However, as van der Kolk (2003) explains, many trauma survivors require incorporation of some form of somatically oriented therapy to attain a sense of safety and mastery over bodies that have become highly dysregulated as a result of chronic trauma exposure and adaptation.

A trauma-sensitive yoga intervention is one mind–body approach to treatment, which has shown a positive impact on the physical and mental well-being of trauma

survivors. Through gentle breath and movement, trauma-sensitive yoga offers trauma survivors a means to cultivate a more positive relationship to their bodies and ease many of the symptoms of traumatic stress (Emerson, Sharma, Chaudhry, & Turner, 2009). In this article, we present our work with a yoga-based intervention for traumatized adolescents living in residential treatment facilities. Although youth may arrive at a residential treatment facility for a number of reasons, the majority have faced a childhood marked by abuse, neglect, impaired caregiving, or exposure to violence (Jaycox, Ebener, Damesek, & Becker, 2004; Singer, 2007; Zelechowski, Sharma,

¹Joseph Spinazzola, PhD, The Trauma Center at Justice Resource Institute, Inc., Brookline, MA, USA

²Alison M. Rhodes, MSW, EdM, The Trauma Center at Justice Resource Institute, Inc., Brookline, MA, USA, and Boston College, Chestnut Hill, MA, USA

³David Emerson, E-RYT, The Trauma Center at Justice Resource Institute, Inc., Brookline, MA, USA

⁴Ellen Earle, Justice Resource Institute, Inc., Marlboro, MA, USA

⁵Kathryn Monroe, LICSW, Justice Resource Institute, Inc., Marlboro, MA, USA

Corresponding Author:

Alison M. Rhodes, The Trauma Center at Justice Resource Institute, Inc., 1269 Beacon Street, Brookline, MA 02446, USA
Email: AlisonMRhodes@gmail.com

Baserra, Miguel & DeMarco, in press). Our clinical experience with this population over the past several years has demonstrated the potential for yoga to play an important role in helping shift chronically traumatized adolescents' relationship to their bodies from negligence, gross indulgence, numbing, or self-harm toward the capacity to feel safe in and accepting of their bodies, to increase tolerance and regulation of painful affect states and behavior impulses, and to begin to identify, cultivate, and positively appraise physical competencies.

Trauma Among Youth in Residential Treatment Facilities

Prevalence of trauma among youth in residential treatment. In 2003, more than 42,000 youth were reported to be in residential treatment programs (Warner & Pottick, 2003), and it is estimated that up to 71% of these youth had histories of exposure to traumatic experiences (Jaycox et al., 2004). Research indicates that neglect is the most common type of trauma experienced by these youth, with best estimates ranging from 51% to 69%; followed by physical abuse, with estimates ranging from 42% to 63%; and then sexual abuse, with estimates ranging from 18% to 47% (Dale, Baker, Anastasio, & Purcell, 2007; Hussey & Guo, 2002). Additionally, Singer (2007) reports that youth in residential treatment facilities were commonly victims or witnesses to violence in their communities or schools.

Psychological and physical impacts of trauma. Posttraumatic stress has traditionally been characterized by three major symptom categories. First, survivors reexperience the trauma through, for example, automatic and intrusive vivid memories or flashbacks. Second is a chronic experience of hyperarousal. For instance, trauma survivors often report feeling on guard, having a heightened startle response, and difficulty sleeping. Finally, survivors experience constriction, which includes the avoidant, numbing, or dissociative responses to overwhelming experiences of stress (American Psychiatric Association, 2000; Wilson & Keane, 2004).

Researchers have begun to distill the neurobiological basis of traumatic stress disorders and identify physiological changes that may occur following exposure to acute stress (see, for instance, De Bellis, 2001; Glod & McEnany, 1995; Nemeroff, 2004; van der Kolk, 1994, 2003). These include changes to the brain, which can affect memory and impair information processing (Briere & Scott, 2006; Carrión, Haas, Garrett, Song, & Reiss, 2009). Exposure to extreme stress has also been shown to alter the hypothalamic–pituitary–adrenal axis and affect trauma survivors' ability to modulate behavioral and cognitive responses to subsequent stress (Nemeroff, 2004). In turn, heightened vulnerability to stressors can lead to gastrointestinal problems, disturbed sleep, decreased sexuality, and a heightened fear

response (e.g., increased vigilance, enhanced startle response, rapid heartbeat). Comorbid psychiatric problems are also common among survivors of trauma, including substance abuse, mood disorders, anxiety disorders, self-injurious behavior, and eating disorders (Brady & Sinha, 2005; De Bellis, 2002; Gallop, 2002; Holzer, Uppala, Wonderlich, Crosby, & Simonich, 2008; Kerr et al., 2009; Kilpatrick et al., 2003; Weierich & Nock, 2008; Yates, Carlson, & Egeland, 2008).

In addition to the negative mental and physical impacts of traumatic stress described above, chronic traumatic exposure in childhood—like the abuse and neglect experienced by many youth before arriving in residential treatment facilities—is often associated with attachment impairments, difficulties with self-monitoring, behavioral control, interpersonal attunement, limit-setting, and establishment of healthy boundaries, poorer cognition, negative self-concept, and high-risk behavior (e.g., violence toward self and others, delinquent or reckless behavior, substance abuse; Bateman & Fonagy, 2004; Burgess, Hartman, & Clements, 1995; Cook et al., 2005; Griffin, Martinovich, Gawron, & Lyons, 2009; Lyons-Ruth, Dutra, Schuder, & Bianchi, 2006; Pearlman & Courtois, 2005; Spinazzola et al., 2005; van der Kolk, 2003). A preponderance of empirical evidence suggests that chronic childhood trauma has a profound effect on neurobiological systems that affect long-term immunological and health outcomes (Dube et al., 2009; Irish, Kobayashi, & Delahanty, 2010; Wegman & Stetler, 2009). Moreover, the detrimental impacts of trauma may be exacerbated in residential settings where youth may be retraumatized when they are placed suddenly and unexpectedly and forced to adapt to a new environment with unfamiliar people (Bloom & Reichert, 1998; Zelechowski et al., in press).

Need for trauma-focused interventions for youth in residential treatment. It can be challenging to diagnose a history of childhood trauma among youth who “tend to communicate what has happened to them not in words but by responding to the world as a dangerous place and by activating neurobiological systems geared for survival, even when they are safe” (van der Kolk, 2003, p. 309). Expressions of trauma-related distress often manifest themselves differently in youth than in either young children or adults. These can be embedded within or masked by other clinical presentations, often in the absence of overt, hallmark symptoms of posttraumatic stress. This can contribute at times to failure to recognize the complexity of the trauma response in youth. Moreover, the complexity of youth adaptation to chronic trauma can also lead to misdiagnosis of what in fact are expressions of posttraumatic coping or distress as signs of conduct problems, personality deficits, or else as independent manifestations of other eating, substance or mood disorders (Cook et al., 2005).

Given these challenges of accurate conceptualization of equivocal and comorbid clinical presentations, it is no surprise that youth in residential treatment facilities are often misdiagnosed or given stigmatizing labels (e.g., “oppositional,” “aggressive,” or “antisocial”), which do not address the underlying traumatic etiology of their mental health problems (Levin, 2009; van der Kolk, 2005). A failure to accurately diagnose trauma likely leads to inappropriate treatment (Hillary & Schare, 1993; Levin, 2009). For example, a child with a history of physical abuse may have difficulty with self-regulation and act out in an aggressive manner, but the restraint or seclusion techniques often used to address these behaviors may be retraumatizing (van der Kolk, 2005). Given the high prevalence of trauma histories among youth in residential treatment facilities, there is a critical need for trauma-focused interventions, and effective treatment depends on youth developing a sense of safety in their bodies and a sense of control over their emotions and behaviors (Burgess et al., 1995; Levin, 2009; van der Kolk, 2003; Zelechowski et al., in press).

Mind–Body Modalities to Promote Mental Health

A growing number of interventions that involve the mind and body in treatment are being developed, and research shows promise for the positive mental health promoting capacities of such interventions. These include, for instance, progressive muscle relaxation (Delgado et al., 2010), deep breathing (Arch & Craske, 2006), meditation (Salmon et al., 2004; Schreiner & Malcolm, 2008), sensorimotor therapy (Ogden et al., 2006), eye movement desensitization treatment (Barron, Curtis, & Grainger, 1998; Korn, 2009; van der Kolk et al., 2007), arts therapy (Deirdre, 2006), music therapy (DeCarlo & Hockman, 2003; Hendon & Bohon, 2007), and dance/rhythmic movement interventions (Berrol, 1992; Farr, 1997; Harris, 2007; Lobo & Winsler, 2006; Macy, Macy, Gross, & Brighton, 2003). Because yoga is an integrative practice combining elements of mindful meditation, breathwork, and rhythmic movement, it may be particularly effective for the treatment of many clinical conditions (Salmon, Lush, Jablonski, & Sephton, 2009).

Yoga for Treatment of Traumatic Stress Disorders and Comorbid Mental Health Problems

Yoga has been used effectively to treat many of the symptoms of traumatic stress disorders and comorbid conditions, including insomnia, anxiety, and depression (Cohen, Warneke, Fouladi, Rodriguez, & Chaoul-Reich,

2004; Khalsa, 2004; Khalsa, Shorter, Cope, Wyshak, & Sklar, 2009; Pilkington, Kirkwood, Rampes, & Richardson, 2005). Practicing yoga has also been shown to improve stress management, quality of life, and emotional well-being (Granath, Ingvarsson, von Thiele, & Lundberg, 2006; Moadel et al., 2007).

Features of a yoga practice that may be effective in reducing traumatic symptomatology include the breathwork, asana (i.e., the physical postures), and meditation. Yogic breathwork involves controlling the depth and rate of breathing. Research indicates that breathwork can improve emotional regulation (Arch & Craske, 2006), modulate the sympathetic nervous system, and improve heart rate variability (Brown & Gerbarg, 2009). A yoga breath intervention tested among survivors of the 2004 Southeast Asia tsunami led to a significant reduction in symptoms of PTSD and depression (Descilo et al., 2010). The meditative aspects of yoga practice have been shown effective in decreasing ruminations (Bortz, Summers, & Pipe, 2007); reducing anxiety, depression, and stress (Schreiner & Malcolm, 2008); and treating substance abuse (Bowen, Witkiewitz, Dillworth, & Marlatt, 2007). Mindful meditation has also been shown to increase brain gray matter concentration, which is involved in learning, memory, emotion regulation, self-referential processing, and perspective taking (Holzel et al., 2011).

The therapeutic impact of yoga asana is likely related to the neurocognitive aspects of PTSD. The physical practice of yoga poses may provide a present-moment somatic focal point that feels safe to trauma survivors who are often overwhelmed by body sensations (Salmon et al., 2009; van der Kolk, 2006). Salmon et al. (2009) explain that “yoga, and other repetitive motion patterns, appear to restore and entrain the rhythmicity of biological functions that are often disrupted during periods of stress” (p. 62). A recent study by Streeter et al. (2007) found that yoga asana practice increased brain GABA levels, which are low among individuals with PTSD. When rhythmic movement is done with others, it may also spark a feeling of connection (Berrol, 1992; Macy et al., 2003), which is an important component of healing after trauma (Herman, 1992). Berrol (1992) explains that in shared movement, “the individual becomes a part of a collective, united by external rhythmic elements in synchronous movement” (p. 26).

In sum, although yoga has yet to be established as an empirically supported treatment for trauma-related disorders and conditions, the convergence of extant research on application of its component elements toward improvement of neurobiological, physiological, and mental health outcomes is highly consistent with prevailing definitions and benchmarks for evidence-based practices and as such lends solid support to the pursuit of yoga as an adjunctive practice for this population (Kendall & Beidas, 2007). This research converges with our systematic clinical

observations that the practice of yoga as an adjunct to formal trauma-focused clinical intervention appears to contribute meaningfully to the amelioration of various emotional, cognitive, physiological, and behavioral health symptoms associated with trauma-related conditions and disorders.

Yoga for Traumatized Youth

Although research has yet to examine directly the efficacy of yoga as a component of intervention for youth with PTSD per se, a number of studies have supported the benefits of yoga practice in treatment of several often interrelated mental health problems faced by adolescents. Specifically, various studies have demonstrated effectiveness of yoga-based interventions with adolescents in reducing symptoms of eating disorders (Rain, Fyfe-Johnson, Breuner, & Brown, 2010) and attention deficit hyperactivity disorder (Jensen & Kenny, 2004), decreasing antisocial behaviors (Kannappan & Lakshmi, 2008), and reducing gastrointestinal problems and emotion-focused avoidance (Kuttner et al., 2006).

Research conducted on mind-body interventions for youth, which like yoga involve application of three integrated treatment components—breathing, meditation, and rhythmic movement—further support the potential of yoga-based interventions for traumatized youth. For instance, a recent study by Gordon, Staples, Blyta, Bytyqi, and Wilson (2008) showed a significant decrease in PTSD symptoms for postwar Kosovar adolescents who participated in a mind-body skills group involving these three components of intervention. Similarly, Macy et al. (2003) and Tol et al. (2008) have amassed considerable evidence across a series of international studies demonstrating the efficacy of a rhythmic movement-based intervention for traumatized youth. They highlight the empowering and self-esteem building implications of mastering particular movements and further surmise that the rhythmic quality of movement may activate the parasympathetic nervous system (Brown & Gerbarg, 2009), thereby enhancing one's capacity to feel safe and grounded.

Trauma-Sensitive Yoga in the Residential Setting

The Trauma Center Yoga Program, a partnership of yoga teachers and trauma-informed clinicians, has been developing a form of Hatha yoga as an adjunct treatment for PTSD and related conditions since 2003 (Emerson et al., 2009). Hatha yoga is a general term to describe the practice of physical postures and breathwork—what we commonly refer to in the West simply as “yoga.” There are many styles of Hatha yoga (e.g., Iyengar, vinyasa,

asthanga, Bikram), but when the term *Hatha yoga* is used in the West in contrast to another specified style, it most often designates a more gentle, slower-paced approach to the physical postures. The Trauma Center Yoga Program was designed in recognition of the profound impact trauma has been established to have on the body, from health outcomes to physical functioning, from trauma survivors' objective capacity to tolerate and regulate somatic functions in an effective and comfortable manner, to their subjective appraisal of their bodies and its impact on self-image and perceived agency. The impetus for establishment of the Trauma Center Yoga Program stems directly from this conceptual vantage on the somatic imprint and often enduring effects of trauma exposure, guided by the hypothesis and rationale that yoga might provide a gentle, incremental mechanism to facilitate traumatized individuals' cultivation of safe, healthy relationship with their bodies as part of their overall mind-body healing process.

Our application of trauma-informed principles toward development of a model of adjunctive yoga intervention with adults has been described elsewhere (Emerson et al., 2009). Based on successful implementation of this model with adults, in 2008 we commenced adaptation of this model for use with youth aged 12 to 21 years receiving comprehensive educational, behavioral, and mental health interventions in residential school settings for youth with serious emotional and behavioral problems. Over the past 3 years, our program team members have worked extensively with personnel, classroom teachers, mental health clinicians, and nursing staff in these residential facilities to integrate, evaluate, and refine group and individual yoga instruction into the fabric of routine programming. The following two composite case vignettes are provided to illustrate the assimilation of trauma-informed yoga into the treatment plans of youth in congregate care settings. Cases have been disguised in accordance with consent process and clinical requirements, with inclusion of only those details most salient to elaboration of the concepts and processes being raised herein.

Case Vignette: Samantha

Samantha is a 16-year-old student of mixed Caucasian and African American ancestry who had been residing at a residential treatment facility in the Northeastern United States for 6 months prior to onset of yoga services. She originally transferred to this residential setting from foster care, as her foster mother was unable to keep her safe in the home. Prior to entering foster care, Samantha had been living with her biological mother and father. According to reports, Samantha witnessed significant domestic violence and, at times, was the victim of physical abuse by one or both of her biological parents.

Reports indicated that Samantha was often neglected by her parents, coming to school with an unkempt presentation and smelling of foul odors. Because of extensive abuse and neglect, Samantha was permanently removed from her home approximately 7 years prior to entering the residential facility. She also experienced abrupt separation from multiple older siblings who were removed from this home of origin and placed into foster care during the same time interval.

At the time of admission to the residential program, Samantha carried diagnoses of mild mental retardation, PTSD, and psychotic disorder NOS. Samantha initially presented as cheerful and engaged with peers and staff members. However, shortly following admission to the program she began to exhibit abrupt shifts in mood. These were typically characterized by sudden, escalating episodes of tearfulness and irritation, culminating in explosive self-harming or aggressive behaviors, including binge eating and hoarding of food, and then followed by long periods of social withdrawal, shame, and dysphoria. This sequence appeared most often to be triggered by Samantha's often erroneous but over time self-fulfilling perceptions of interpersonal rejection, threat, unfairness, or inferiority, often centered on negative self-attributions of herself as "a fat, ugly klutz." Samantha's difficulty reading social cues, tolerating disagreement with others, and engaging in effective communication of needs became identified over time as key precipitating factors of her emotional and behavioral dysregulation.

Samantha received extensive individual and group therapy. Group therapy for Samantha was focused on improving social skills and increasing coping skills. Individual treatment primarily focused on furthering Samantha's repertoire of coping skills, practicing relevant social skills, and processing the trauma Samantha endured at a young age. Another strategy identified to assist Samantha with emotional regulation and improving her overall sense of self was the engagement in recreational activities. However, whereas Samantha reported thoroughly enjoying sports and other activities that incorporate physical movement, staff at her residential program observed her to often become overstimulated and dysregulated when participating in group activities or sports that required prolonged period of running, jumping, or competitive activity with peers.

In the month prior to yoga services onset, Samantha was hospitalized because of an acute presentation of psychotic features. Following successful acute stabilization and return to her residential treatment program, Samantha requested to participate in yoga programming. Her treatment team agreed to a trial of yoga as a potentially more structured, contained way to engage her in physical activity with the underlying goals of increasing her comfort with her body, recognizing somatic signals of anxiety,

and learning ways to use breathing and mindfulness to restore calm and self-control and prevent escalation of distress into maladaptive outbursts with destructive consequences for self and others.

Samantha was assigned to participate in two to three yoga sessions per week. Sessions were intentionally brief (approximately 15 minutes in duration) to avoid being overwhelming and to foster gradual familiarity with and tolerance of low-to-moderate somatic arousal and incremental mastery of routines. Yoga sessions were designed to alternate between three different configurations: in her classroom with her teacher and peers (total class size was six students); in a triad that included Samantha, the yoga instructor, and a trusted residential staff; and in a quad (group of four) that included Samantha, one nonconflictual peer, a trusted residential staff, and the yoga instructor. The classroom sessions were chair based to titrate the potential level of group activation; the other two session configurations used yoga mats.

For the first 3 months of yoga practice, Samantha was most typically observed to engage in the motions and sequences of her yoga sessions in a very measured way, doing exactly what the instructor said but not reporting very much connection with her body. Despite Samantha's initial lack of self-awareness regarding impact of yoga on her body, she remained in compliance with attendance of sessions, and program staff noted a nearly 50% reduction in the number of behavioral incidents engaged in by Samantha at the facility at the end of 3 months of practicing yoga.

Samantha responded favorably to all three yoga session configurations employed, and she and her program staff identified distinct benefits of each configuration. For example, in the classroom she was afforded the opportunity to join her peers in shared activity and "blend in a little." With one peer and a residential staff person she gets to demonstrate to others what she has learned and will often demonstrate some of her favorite forms with less fear of teasing or judgment as might occur in a larger group. Notably, when a student new to yoga joined her in this quad configuration, Samantha was observed to be very welcoming and encouraging, and delighted in taking on somewhat of a mentoring role, conveying learned wisdom to this newcomer: "It can be kind of hard at first, and sometimes a little boring, but if you stick with it [yoga], I'm sure you will really like it and it will even help you out with stuff." Finally, in the triad configuration Samantha was granted the freedom to focus more exclusively on her own practice.

The triad configuration afforded Samantha the opportunity to attend more carefully to the sensations she noticed in her own body and to experiment with modifying postures to suit her particular needs. In some instances this has entailed discontinuing a pose that she experienced as uncomfortable or straining. At other times it has

meant experimenting with increasing the intensity of the dynamic (a particular stretch, for example) to explore sensations of increased flexibility, reach, or strength.

Through this practice, Samantha has demonstrated heightened somatic awareness and responsiveness to bodily needs that appear to have generalized in important ways to other facets of her daily life. For instance, residential staff observed that Samantha has begun to better self-monitor her eating behavior, noticing and verbalizing when her stomach feels full and even at times declining extra portions of dessert in these instances, in stark contrast to her characteristic bingeing and hoarding behavior. Likewise, over the course of her yoga practice she exhibited increased openness to working with milieu and clinical staff to actively practice self-soothing techniques to cope with feelings of anger, sadness, and loneliness. After approximately 6 months of participation, Samantha was able to report the following perceived gains:

Doing yoga helps me pay more attention to how I'm feeling. I dunno why but it kinda tunes me in to when I'm tired or mad or too amped up and need to chill out or eat something or talk something out with a staff before I totally lose it. It also definitely makes my muscles stronger, which is big, because I feel less flabby and weak and don't hate on my body as much as I used to.

These astute observations, coupled with clinical observations of Samantha's continued gains in affect regulation and impulse control, seem indicative of a burgeoning ability to listen to her body and respond appropriately to its signaling of needs such as hunger, fatigue, anger, and distress. In her ninth month of yoga practice, Samantha began bringing her own mat, received as a requested holiday gift, to sessions, an action suggestive of a deepening level of personal investment in and ownership of this empowering and self-regulating practice.

Key Elements of Trauma-Sensitive Yoga

The primary goal of trauma-sensitive yoga is to provide students a guided and structured practice that allows them to reconnect to and eventually feel safe in their bodies. For many children, successful adaptation to chronic exposure to maltreatment or neglect involves learning to relate to and regulate their bodies in ways that subsequently become regarded as dangerous or self-destructive. To endure physical and sexual victimization or survive deprivation of basic bodily needs, such as hunger, warmth, and caring human contact, children often come to develop habit-forming survival and coping strategies such as food restriction and hoarding, interpersonal shunning and aggression, self-stimulation and self-harm,

dissociation, and stifled awareness of somatic experience. Trauma-sensitive yoga endeavors to provide and cultivate alternative strategies for youth to respond to physical manifestations of pain and distress in an agentic, embodied manner.

The trauma-sensitive yoga model employs continuous reflective prompts verbalized by the yoga teachers intended to create opportunities for students to begin to notice physical sensations and eventually to be able to respond to them in a more effective and agentic manner. The model refers to this process as "reclaiming your body," stemming from the premise that for many victims exposure to traumatic events and the subsequent physiological and psychological consequences entails the experience of having one's body "hijacked." In turn, healthy recovery involves the rebuilding, restoration, or instillation of physical as well as psychological capacities and competencies that have been derailed, delayed, or underdeveloped as a consequence of exposure to maltreatment, violence, neglect, and other forms of life adversity.

Practice illustration. In this model of yoga practice, instruction is predicated on invitational language emphasizing gentle exploration of bodily movements and associated physical sensations, student choice, cultivation of self-awareness and curiosity about one's body, and prioritization of pacing of duration, speed, and intensity of activities in a manner that maximizes self-care. As such, trauma-informed yoga practice differs dramatically from some contemporary Western approaches to yoga practice that encourage students to push themselves to their physical limits and emphasize rapid progress in execution of increasingly more difficult postures.

The following example illustrates how trauma-sensitive yoga might unfold in an actual class. The yoga instructor may invite students to experiment with some gentle neck rolls:

Gently lower your chin toward your heart and then experiment with softly rolling your neck from side to side, allowing your chin to drop in the middle of each roll. This is the beginning and it may be enough for awhile: just experimenting with gentle movement.

The next invitation might be, "You may notice some sensation around your neck." This prompt encourages students to begin to notice physical sensation associations with the exercise. The instructor may further name observed sensation as that of "your neck muscles stretching" to provide context for the feelings that students may be experiencing during this exercise. It should be noted that it is not uncommon for students to not feel any sensation at first; this possibility is also anticipated and normalized by trauma-sensitive yoga teachers in the course of their verbalized guidance of

class exercises. Critical in this instruction is maintaining a framework of acceptance that neither places pressure on students to feel various sensations nor inadvertently shames them for not feeling particular sensations, but that instead invites them to experiment and explore a very specific somatic experience—the gentle movement of their neck. Engagement in this single practice may be sufficient for several moments or more.

The next and final step in this sequence would be, once students have demonstrated sufficient practice with noticing sensation, to invite them to interact with it effectively. This option would be conveyed through verbalization of instruction such as the following:

If you notice any discomfort around your neck you can always stop what you are doing. Another option is to make the movements smaller and see if you can keep moving but without any discomfort. Another option might be to experiment with making the movements a little bigger.

Such prompts provide carefully structured opportunities for students to get to make some important choices for themselves, an approach that is predicated on the belief that the return of personal agency and choice is a critical element of healing from trauma. “If I feel pain, I can stop. I have some control. I can also experiment and make the movements smaller or bigger. It’s up to me.” The critical outcome of such choice is taking some decisive action and then noticing any somatic, affective, or cognitive changes as a consequence of this action. One goal of this process is for students ultimately to become able to identify what feels “good” to them and what is uncomfortable and to have had the experience of personally engaging in some form of intentional action that made them feel better. This is a core aspect of “reclaiming the body” from the hijacking of trauma.

Configurations of Trauma-Sensitive Yoga in the Residential Setting

Although there are no absolute inclusion or exclusion criteria for youth to be able to participate in the yoga classes, in our application of trauma-sensitive yoga with youth, all participants have a history of exposure to traumatic events and observed difficulties with self-regulation and/or PTSD. Participation in the classes is completely optional for youth in the residential treatment facilities we serve. All youth are offered the chance to participate, but only those students who express an interest participate in the classes.

Teaching trauma-sensitive yoga has occasionally demanded certain adjustments to the typical compliance regimen at the residential facilities. For example, in some

cases, we have had to redefine what “participation” means. For instance, one residential program had certain expectations regarding participation where students who did not actively engage in an assigned activity “lost points” or received a demerit that had an effect on their ability to receive desired incentives (e.g., a trip to the movies, etc.). However, a key aspect of trauma-sensitive yoga is that participants do not have to do any postures that they choose not to do. This is an important part of reclaiming ownership over one’s experience (i.e., reclaiming your body). We had to explain this very important dynamic of “choice” to administrators and have the yoga class be an exception to this general rule.

The class structure includes a staff member from the residential program, the yoga teacher, and anywhere from one to four students living in the residential treatment facility. The residential staff person attends yoga sessions to help maintain a basic level of compliance with the general program rules. The intention of having a residential staff person present at yoga sessions is to enable this trained staff member to oversee and safeguard behavior management to ensure that the yoga teacher can focus exclusively on delivering the trauma-sensitive yoga instruction. It is ideal for the residential staff person to do the yoga poses with the students. This provides another level of support, normalization and mirroring for the students. Because many staff members have limited (or no) yoga experience, their participation in the classes models a willingness to try the poses, even if executed without precision or knowledge of the practice. Students generally appreciate that staff are willing to try their best at yoga and it gives many students a form of “permission” to try something that may be a little outside their own comfort zone.

Although residential staff attending yoga sessions need not have any yoga experience, we recommend well-trained yoga teachers who are also trained to understand trauma and PTSD to lead the yoga sessions in this particular setting. This is because our model favors the integrity of the yoga instruction and seeks to adhere as much as possible to a very recognizable yoga class dynamic. We want students to be able to experience highly competent yoga instruction delivered by a yoga teacher who is also trained to understand some of the specific challenges and experiences of trauma survivors, adapting the yoga practice as needed.

Class size is another important consideration for yoga instruction with traumatized individuals in the residential setting. In our center’s service offerings as well as systematic outcome research on the efficacy of yoga with traumatized adults, we consistently observed participant attrition to vary as a direct function of classroom size, with larger classes leading to higher rates of dropout. We have interpreted this pattern to be a function of the susceptibility of this population to interpersonal triggers.

This tendency, observed in our trauma-focused clinical group work in general over the past three decades, appears to be potentiated by the response demands of even gentle yoga with traumatized individuals, which entails engagement of often highly disembodied, socially avoidant individuals in a communal practice that includes enacting and witnessing a variety of stretches and postures that inherently asks participants to place themselves in vulnerable physical positions.

Not surprisingly, within our Center's first year of piloting trauma-informed yoga in residential treatment of youth with severe emotional and behavioral problems, this tendency of participants to experience dysregulation, triggered or spontaneous, when participating in even moderately sized yoga groups and subsequently to drop out of the class, was even more pervasive than with traumatized adults. Consequently, over the ensuing 2 years we developed three small group configurations for gentle yoga instruction with traumatized youth that address these concerns while maintaining the elements of social role modeling, communal learning, and somatic coregulation believed to be essential components of restoration of developmental capacities in complexly traumatized youth (Blaustein & Kinniburgh, 2010; Cook et al., 2005; Hughes, 2006; Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005).

Classroom configuration. Over the past several years, we have discovered that many students in residential school settings are most comfortable practicing yoga in their established, daily academic small classrooms in which they can receive the support of their regular teacher and be surrounded by known peers. This configuration appears to optimize integration of yoga as a regular practice embedded within the normal routines of their daily schooling, thereby providing the highest degree of consistency and predictability, additional elements identified to be critical to intervention with complexly traumatized youth (Blaustein & Kinniburgh, 2010; Kinniburgh et al., 2005). In our experience, this familiar context has been especially beneficial for students who struggle with significant social phobias or anxieties such as Samantha above. For such students, the residential program makes an effort to create as much consistency as possible in terms of daily life, for example, they stay with the same teacher and in the same classroom throughout the school day. This classroom space and the consistency of the teacher become the crux of the therapeutic milieu for these youth as they learn to inhabit both their own space safely and to interact appropriately with others. Rather than risk disruption of this critical milieu by taking the students out of that stabilizing environment to participate in yoga classes, our model instead introduces yoga into the preestablished safe and containing space of their school classroom. This enables traumatized youth who

are highly sensitive to transitions and changes in their environment to receive the benefits of a trauma-sensitive yoga practice with minimal disruption and maximum consistency of daily routine, setting, and interpersonal contacts.

Triad configuration. The next configuration used with traumatized youth in residential settings is the triad: student, yoga instructor, and trusted residential staff person. This configuration requires establishment of a dedicated space at each facility for the practice of yoga: this can be a small classroom not otherwise in use during the designated time period, a group therapy room, or a recreation or exercise room cleared and reserved for this purpose. For triad yoga classes, students are excused from their routine classroom setting one to three times per week and invited to take a 15-minute "yoga break." Practice is tailored to meet individualized student needs, and students are given as much choice and control as appropriate over the postures and pacing of the class. To this end, the yoga instructor has a deck of yoga cards each describing a particular form. Many students elect to pick a few cards that they would like to focus on during the 15-minute session. Less self-directed students can be prompted by gentle inquiry from the yoga instructor, who might ask the student "What they notice in their body today?" or some question to that effect. If a student replies, for instance, "I feel a lot of tightness in my back," this could then become the focus of that day's yoga session, experimenting with postures that may have a positive effect on the muscle group in question. At the end of sessions using this format, the instructor will ask, "Did you notice any changes in the sensation in your back?" thereby giving the student a chance to notice and describe any changes they might have experienced as a result of the yoga session.

On one occasion in a triad yoga class, a student told her yoga instructor that when she folded forward she felt "queasy." The instructor took this opportunity to remind the student that if she feels uncomfortable for any reason in any form she can always come out of the form, using the specific language, "You always have control and this is a key part of the yoga practice." For a period of time, this became the central focus for this student: experimenting with a forward fold and choosing to come out of the form if she felt queasy. For this student, noticing her level of squeamishness or nausea and making choices around it was her explicit way of practicing yoga in a manner that increased somatic awareness, personal agency, and self-control. Such is the essence of trauma-informed yoga.

Quad configuration. The final configuration employed with traumatized youth in residential treatment settings is that of a small group of four individuals comprising two students, the yoga instructor, and a trusted residential staff person. In this case, many of the same dynamics and

processes of the triad apply, in which students get to tailor the session very specifically to their own needs or curiosity. However, embedding this yoga practice within a supervised, peer dyad allows for some interaction between students, and this configuration creates a contained context for youth socialization around shared physical practices.

The structured peer dyad engendered through this quad configuration can also contribute to peer support, assistance, empathy, and perspective building, all of which are important building blocks to healthy social development for youth. At times, such peer interactions spontaneously take the form of one student encouraging another verbally (“you’re doing great!” “way to give that a try”). Another benefit of this configuration is that it fosters equity and reciprocity. These classes are sequenced such that students take turns selecting postures, and trauma-informed yoga teachers are trained to alternate the focus of instruction consistently between students. Within this context, youth are afforded ongoing opportunities to receive and share attention and are reinforced for supporting each other in tangible and specific ways. For example, in one class one student chose a hip stretch that she had been practicing for months. The second student in this class was new to yoga and had never tried this posture before. This yielded an occasion for this student to teach the posture to her new classmate. In doing so, the more experienced student got to experiment with both verbalization of the form and also demonstration of the form with her own body in a safe, appropriate manner. In turn, the new student was spontaneously given the opportunity to engage in peer-based social learning, hopefully coming to recognize and value her peer as a source of acquired body-based knowledge that she was willing to transfer altruistically to another. Again, such processes are fundamental to trauma-sensitive yoga practice.

Case Vignette: Danny

Danny is a 17-year-old Caucasian male enrolled in a residential school in response to school expulsion for fighting, truancy, and assaulting a male teacher. Danny’s mother had committed suicide several years prior to his first yoga session. Prior to her death, Danny had a documented history of chronic witnessing of domestic violence and sporadic, severe physical abuse perpetrated against him by his biological father. Reports from social services indicated that as Danny physically matured in mid-adolescence, he began to seek out and attempt to retaliate against his estranged father with increasingly volatile assaultive behavior. At 17, Danny was 6 feet tall with a nearly 190 pound muscled frame. He spent hours every day lifting weights and had honed a very strong, very tense, very dangerous body.

On admission to the residential treatment facility, Danny exhibited difficulty understanding social rules and how to develop relationships in a safe and appropriate manner. He manifested a lack of cause and effect thinking, an exaggerated startle response, and a tendency to interpret neutral interactions from male peers and staff as expressions of hostility and in return to respond with threatening verbal behavior and physical posturing. He had been diagnosed with conduct disorder and intermittent explosive disorder. Numerous staff appeared to be afraid of him, and in multiple milieus, academic and clinical staff had complained to the program director or their immediate supervisors requesting reassignment of Danny to a different classroom, clinician, or floor in the residence, seemingly so as not to hold primary responsibility for behavioral management of Danny.

During an initial evaluation of suitability to engage in yoga programming, conducted in his second month at the residential treatment facility, Danny was noted to possess little awareness of his emotions and their relationship to somatic states of arousal and dysregulation. Exposure to trauma-informed yoga was initiated in the context of a quad configuration with one other student (a younger, physically slighter adolescent male whose sense of humor Danny had been observed to respond to in a positive manner and who Danny clearly did not experience as a potential threat), one staff member (a pleasantly gruff, athletic African American female milieu shift supervisor to whom Danny appeared to relate well), and the yoga teacher.

When he came into the room for his first yoga class, Danny paced back and forth for several minutes before talking. He was hyperventilating, breathing in a rapid, jagged fashion. When he did start talking, his first words were, “I am so angry, I don’t know what to do.” The yoga teacher was well aware, through his body language alone, that Danny was wound incredibly tight and felt that it was of utmost importance to give the young man something to do with his body that would offer him a chance to simmer down. This is where the trauma-sensitive yoga began for Danny. The instructor asked Danny if he would like to “experiment” with a little yoga. Danny stated that he really was not sure if this would be of any use to him but agreed to give it a try. They began with simply standing and observing the breath. The invitation was to notice what it feels like to breathe, paying particular attention to the “physicality of breath” (where do you feel the breath in your body?). They quickly shifted into moving, starting with neck and shoulder rolls. For the next 30 minutes, Danny and the yoga instructor “experimented” with breathing and moving on the yoga mat. As this was Danny’s first session, the other student and the staff member, both of whom had previously participated in the trauma-sensitive yoga program, were asked to follow along at the same pace to maximize this quad configuration

as an opportunity for interpersonal attunement, modeling, and normalcy for Danny.

Over the course of this initial session, Danny's physical presentation began to change dramatically. His facial muscles unclenched. His shoulders dropped. His breathing lengthened and slowed noticeably. At the end of the session, after about a minute of sitting quietly, Danny smiled and reported feeling much more at ease. He was referred to yoga by his therapist who felt that what Danny needed more than anything was to feel safe in his body. He needed some way to be physical that was not violent, frightening, or dangerous.

To the surprise of several residential staff members (most of whom evidenced a conflictual relationship with this challenging new student), Danny took quickly to the yoga sessions, albeit expressing greater interest in engagement in strength-based skills and postures versus stretching or more internal-oriented elements such as meditation. In particular, Danny exhibited a particular affinity and greatest focus when practicing the various warrior positions (strong, standing poses where one leg is in a lunge and arms are outstretched). Notably, Danny enjoyed ending his yoga sessions with deep breathing techniques with his legs propped up on a yoga ball.

Over the course of several weeks of sessions, Danny began to report more body awareness at the end of classes when prompted by the yoga teacher, who in turn encouraged Danny to explore some of the feelings and sensations he was beginning to notice in the context of his individual psychotherapy sessions. In those sessions, Danny began to talk about his anger and desire for retribution. Clinical supervision of his psychotherapist focused on helping his therapist manage her own fear- and anxiety-based emotional and physiological responses to these often disarming verbalizations. This enabled Danny's therapist to maintain a nonjudgmental stance of openness and physical groundedness where Danny's impulses could be normalized within the framework of psychoeducation about the impact of exposure to violence and trauma on the human stress response. This approach gradually fostered in Danny a sense of connection with his therapist, achievement of which was a critical precursor to willingness to consider and practice prosocial coping and self-regulation skills. In turn, Danny's therapist was able over time to redirect these conversations to discussions of social justice, in which Danny showed great interest. Eventually, and in tandem with the increased somatic awareness he was developing in his yoga sessions, Danny and his therapist were able to explore the notion of what it meant to feel "strong on the inside" and to entertain alternatives to violence in response to the experience of being wronged by another.

Further Examples of Trauma-Sensitive Yoga in a Residential Setting

The idea of a yoga class becomes fluid when working at a residential treatment center, where staff members are faced with seemingly endless competing demands and students contend with innumerable internal and environmental pressures, pulls, and distractions. Sometimes instructors are able to secure little more than 5 minutes with a given student. In these instances, the question becomes, "What of value can I safely and constructively offer this young person in five minutes?" In this context, the actual postures and yoga exercises become less important and the principals underlying student engagement of the postures become more critical. Giving a student a few minutes to tune into and make some real choices in regard to their body takes priority over executing any particular posture.

For example, during a 15-minute session, a relatively new student in his third trauma-sensitive yoga class was experimenting with a gentle spinal twist. After a moment, the student commented that a posture was "painful." This became a critical opportunity to work with him to better recognize the parameters of this sensation and his control over its attenuation, thereby engaging him in the spontaneous practice of agentic self-care. After establishing the fact that he could come out of the posture for any reason and at any time, the yoga teacher next invited this student to try another experiment, which was to decrease the intensity of the twist and notice if that altered his sensation of pain. The specific invitation was to decrease the neck rotation (the dynamic in play that the student could control) and assess if this affected his perception of physical pain. The student immediately noticed relief and was able to communicate this to the yoga instructor.

This brief sequence contained within it a complete experience for this student of trying something suggested by another person (the yoga instructor), discovering that to do so elicited a pain response (listening to his body), receiving the invitation from the yoga instructor to try a modification, trying that modification, and noticing immediate relief from pain. On completion of this sequence, the student was still able to execute the gentle spinal twist, just not in a way that caused him pain. This experiment became the crux of the 15-minute session and aptly demonstrates the priorities of a trauma-sensitive yoga class with youth in residential treatment, namely, the opportunity to feel, experience, notice, and then begin to interact with one's body and physical sensations in an agentic, successful, and possibly self-soothing way. Our hope for trauma-sensitive yoga in the residential setting is that it will afford students a medium and context within which to begin to have and build on safe, consistent,

positive, empowered, body-based experiences. These positive experiences offer contrast to (and may replace) previous somatic associations to trauma, violence, or neglect in which these youth came to experience their bodies as unsafe; out of their control; repositories of pain, fear, or shame; reminders of past victimization; or completely shut down.

Conclusion

The present article provides empirical rationale, conceptualization, and case illustration from one of the first systematic applications of trauma-informed yoga in residential settings. It suggests this approach to be a promising practice for youth with severe emotional and behavioral problems that endeavors to build attachment, self-regulation, and competency in the context of structured, consistent routines. Accordingly, this model of trauma-informed yoga intervention is consistent with prevailing conceptualizations of intervention for complexly traumatized youth (Cook et al., 2005; Kinniburgh et al., 2005).

As illustrated through case examples and vignettes, the teaching and learning processes entailed in this model of gentle yoga practice, versus the fixed or universal administration of specific exercises or techniques per se, are the most critical aspects of its characterization as a trauma-informed intervention. These processes include use of invitational language; emphasis on personal experimentation, choice, curiosity, and self-care; individually tailored selection of postures, pacing, and challenge level; repetition of specific postures and forms to build incremental mastery; application of yoga elements (breathing, meditation, postures) as primary vehicles of self-control and self-regulation (affective, somatic, behavioral, cognitive); and provision of contained opportunities for social learning, attunement and modeling, coregulation, and peer support. As such, trauma-sensitive yoga should be considered primarily a clinical objectives-based form of intervention versus a fixed protocol-driven intervention.

Application of this model of yoga practice has been extensively implemented in three programs to date with youth and young adults: (a) two residential schools for adolescent girls and boys with severe emotional and behavioral problems and (b) a drop-in center for gay, lesbian, bisexual, and transgender youth and young adults with predominant histories of trauma exposure and high risk for substance abuse, sexually transmitted diseases, relationship violence, homelessness, and education, vocational, legal, and mental health problems. Although awaiting further replication and outcome evaluation of this practice model, the present observations lend promise to what may ultimately become established to be significant clinical and policy implications regarding the utility of trauma-informed, gentle Hatha

yoga as a viable and important adjunct to comprehensive trauma intervention.

The promise of current observations suggests the need to conduct formal, controlled research on trauma-sensitive yoga programming with at-risk youth designed to evaluate the distinct and comparative efficacy and effectiveness of yoga as a component of intervention for adolescents exhibiting complex adaptation to chronic maltreatment, adversity, violence, or neglect. This research should integrate current guidelines for reporting of quality improvement initiatives (Davidoff, Batalden, Stevens, Ogrinc, & Mooney, 2008) and should examine the impact of trauma-sensitive yoga on a range of clinical and behavioral outcomes relevant to this population and setting, including reduction of PTSD and related disorders, improved emotion regulation and control of aggressive and impulsive behaviors, and reduction in critical incidents such as physical restraints and psychiatric hospitalizations. Moreover, research on the applications of trauma-sensitive yoga for traumatized youth in residential treatment settings would do well to investigate carefully the mechanisms of change involved with increased youth capacity for somatic regulation, including the impact of yoga on physiological and neurobiological indices that have been implicated in the trauma response, including heart rate, respiration, heart rate variability and muscle activity, and resting and brain states (van der Kolk, 2006).

Author Roles

Joseph Spinazzola was responsible for overall paper conceptualization and outline, primary writing of the conclusion section of the paper, secondary writing of the yoga practice section of the paper, secondary writing of the clinical vignettes, and primary editing of the entire manuscript. Alison Rhodes held primary responsibility for conduct of the literature review and writing of the introduction section of the paper, and held secondary responsibility for editing of the manuscript. David Emerson shared responsibility for paper conceptualization and outline, and held primary responsibility for writing of the yoga practice section of the paper. Ellen Earle and Kathryn Monroe held primary responsibility for writing of the clinical vignettes.

Acknowledgments

The authors would like to thank Bessel van der Kolk, Brittney Burgess, Tara Sagor, and Kari Beserra.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (text revision). Washington, DC: Author.
- Anda, R. F., Brown, D. W., Felitti, V. J., Bremner, J. D., Dube, S. R., & Giles, W. H. (2007). Adverse childhood experiences and prescribed psychotropic medication in adults. *American Journal of Preventive Medicine, 32*, 389-394.
- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44*, 1849-1858.
- Barron, J., Curtis, M. A., & Grainger, R. D. (1998). Eye movement desensitization and reprocessing. *Journal of the American Psychiatric Nurses Association, 4*(5), 140-144.
- Bateman, A., & Fonagy, P. (2004). Mentalization based treatment of borderline personality disorder. *Journal of Personality Disorders, 18*, 36-51.
- Berrol, C. F. (1992). The neurophysiologic basis of the mind-body connection in dance/movement therapy. *American Journal of Dance Therapy, 14*(2), 19-29.
- Blaustein, M. E., & Kinniburgh, K. M. (2010). *Treating traumatic stress in children and adolescents: How to foster resilience through attachment, self-regulation, and competency*. New York, NY: Guilford Press.
- Bloom, S. L., & Reichert, M. (1998). *Bearing witness: Trauma and collective responsibility*. Binghamton, NY: Haworth Press.
- Bortz, J. J., Summers, J. D., & Pipe, T. B. (2007). Mindfulness meditation: Evidence of decreased rumination as a mechanism of symptom reduction. *Journal of Neuropsychiatry and Clinical Neurosciences, 19*, 217-218.
- Bowen, S., Witkiewitz, K., Dillworth, T. M., & Marlatt, G. A. (2007). The role of thought suppression in the relationship between mindfulness meditation and alcohol use. *Addictive Behaviors, 32*, 2324-2328.
- Bradley R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *American Journal of Psychiatry, 162*, 214-227.
- Brady, K. T., & Sinha, R. (2005). Co-occurring mental and substance use disorders: The neurobiological effects of chronic stress. *American Journal of Psychiatry, 162*, 1483-1493.
- Bremner, J. D. (2002). *Does stress damage the brain? Understanding trauma-related disorders from a neurological perspective*. New York, NY: W. W. Norton.
- Briere, J., & Scott, C. (2006). Biology and psychopharmacology of trauma. In J. Briere & C. Scott (Eds.), *Principles of trauma therapy: A guide to symptoms, evaluation, and treatment* (pp. 185-229). Thousand Oaks, CA: Sage.
- Brown, R. P., & Gerbarg, P. L. (2009). Yoga breathing, meditation, and longevity. *Annals of the New York Academy of Sciences, 1172*, 54-62.
- Burgess, A. W., Hartman, C. R., & Clements, P. T., Jr. (1995). Biology of memory and childhood trauma. *Journal of Psychosocial Nursing and Mental Health Services, 33*(3), 16-26.
- Carrión, V., Haas, B., Garrett, A., Song, S., & Reiss, A. (2009). Reduced hippocampal activity in youth with posttraumatic stress symptoms: An fMRI Study. *Journal of Pediatric Psychology, 35*, 559-569.
- Cohen, L., Warneke, C., Fouladi, R. T., Rodriguez, M. A., & Chaoul-Reich, A. (2004). Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer, 100*, 2253-2260.
- Cook, A., Spinazzola, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., . . . van der Kolk, B. (2005). Complex trauma in children and adolescents. *Psychiatric Annals, 35*, 390-398.
- Corso, P. S., Edwards, V. J., Fang, X., & Mercy, J. A. (2008). Health-related quality of life among adults who experienced maltreatment during childhood. *American Journal of Public Health, 98*, 1094-1100.
- Dale, N., Baker, A., Anastasio, E., & Purcell, J. (2007). Characteristics of children in residential treatment in New York State. *Child Welfare, 86*, 5-27.
- Davidoff, F., Batalden, P., Stevens, D., Ogrinc, G., & Mooney, S. (2008). Publication guidelines for quality improvement in health care: Evolution of the SQUIRE project. *Quality & Safety in Health Care, 17*(Suppl. 1), i3-i9.
- De Bellis, M. D. (2001). Developmental traumatology: The psychobiological development of maltreated children and its implications for research, treatment, and policy. *Development and Psychopathology, 13*, 539-564.
- De Bellis, M. D. (2002). Developmental traumatology: A contributory mechanism for alcohol and substance use disorders. *Psychoneuroendocrinology, 27*, 155-170.
- DeCarlo, A., & Hockman, E. (2003). Rap therapy: A group work intervention method for urban adolescents. *Social Work With Groups, 26*, 45-59.
- Deirdre, H. (2006). Art as therapy: An effective way of promoting positive mental health? *Disability & Society, 21*, 179-191.
- Delgado, L. C., Guerra, P., Perakakis, P., Vera, M. N., del Paso, G. R., & Vila, J. (2010). Treating chronic worry: Psychological and physiological effects of a training programme based on mindfulness. *Behavior Research and Therapy, 48*, 873-882.
- Descilo, T., Vedamurtachar, A., Gerbarg, P. L., Nagaraja, D., Gangadhar, B. N., Damodaran, B., . . . Brown, R. P. (2010). Effects of a yoga breath intervention alone and in combination with an exposure therapy for PTSD and depression in survivors of the 2004 South-East Asia tsunami. *Acta Psychiatrica Scandinavica, 121*, 289-300.
- Dube, S. R., Fairweather, D., Pearson, W. S., Felitti, V. J., Anda, R. F., & Croft, J. B. (2009). Cumulative childhood stress and autoimmune diseases in adults. *Psychosomatic Medicine, 71*, 243-250.
- Emerson, D., Sharma, R., Chaudhry, S., & Turner, J. (2009). Trauma-sensitive yoga: Principles, practice, and research. *International Journal of Yoga Therapy, 19*, 123-128.
- Farr, M. (1997). The role of dance/movement therapy in treating at-risk African-American adolescents. *The Arts in Psychotherapy, 24*, 183-191.

- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) study. *American Journal of Preventive Medicine, 14*, 245-258.
- Foa, E., Keane, T. M., & Friedman, M. J. (Eds.). (2000). *Effective treatments for PTSD: Practice guidelines from the international society of traumatic stress studies*. New York, NY: Guilford Press.
- Gallop, R. (2002). Failure of the capacity for self-soothing in women who have a history of abuse and self-harm. *Journal of the American Psychiatric Nurses Association, 8*(1), 20-26.
- Glod, C. A., & McEnany, G. (1995). The neurobiology of post-traumatic stress disorder. *Journal of American Psychiatric Nurses Association, 1*(5), 164-199.
- Gordon J. S., Staples J. K., Blyta, A., Bytyqi, M., & Wilson A. T. (2008). Treatment of posttraumatic stress disorder in post-war Kosovar adolescents using mind-body skills groups: a randomized controlled trial. *Journal of Clinical Psychiatry, 69*(9), 1383-92.
- Granath, J., Ingvarsson, S., von Thiele, U., & Lundberg, U. (2006). Stress management: A randomized study of cognitive behavioural therapy and yoga. *Cognitive Behaviour Therapy, 35*, 3-10.
- Griffin, G., Martinovich, Z., Gawron, T., & Lyons, J. S. (2009). Strengths moderate the impact of trauma on risk behaviors in child welfare. *Residential Treatment for Children & Youth, 26*, 105-118.
- Harris, D. A. (2007). Dance/movement therapy approaches fostering resilience recovery among African adolescent torture survivors. *Torture, 17*, 135-155.
- Hartman, C. R., & Burgess, A. W. (1993). Information processing of trauma. *Child Abuse and Neglect, 17*, 47-58.
- Hendon, C., & Bohon, L. M. (2007). Hospitalized children's mood differences during play and music therapy. *Child: Care, Health, and Development, 34*, 141-144.
- Herman, J. L. (1992). *Trauma and recovery*. New York, NY: Basic Books.
- Hillary, B. E., & Schare, M. L. (1993). Sexually and physically abused adolescents: An empirical search for PTSD. *Journal of Clinical Psychology, 49*, 161-165.
- Holzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging, 191*, 36-43.
- Holzer, S. R., Uppala, S., Wonderlich, S. A., Crosby, R. D., & Simonich, H. (2008). Mediation significance of PTSD in the relationship of sexual abuse and eating disorders. *Child Abuse & Neglect, 32*, 561-566.
- Hughes, D. (2006). *Building the bonds of attachment: Awakening love in deeply troubled children* (2nd ed.). Northvale, NJ: Jason Aronson.
- Hussey, D. L., & Guo, S. (2002). Profile characteristics and behavioral change trajectories of young residential children. *Journal of Child and Family Studies, 11*, 401-441.
- Irish, L., Kobayashi, I., & Delahanty, D. L. (2010). Long-term physical health consequences of childhood sexual abuse: A meta-analytic review. *Journal of Pediatric Psychology, 35*, 450-461.
- Jaycox, L. H., Ebener, P., Damesek, L., & Becker, K. (2004). Trauma exposure and retention in adolescent substance abuse treatment. *Journal of Traumatic Stress, 17*, 113-121.
- Jensen, P. S., & Kenny, D. T. (2004). The effects of yoga on the attention and behavior of boys with attention-deficit/hyperactivity disorder (ADHD). *Journal of Attention Disorders, 7*, 205-216.
- Kannappan, R., & Lakshmi, B. R. (2008). Efficacy of yoga: Cognitive and human relationship training for correcting maladjustment behaviour in deviant school boys. *Journal of the Indian Academy of Applied Psychology, 34*, 60-65.
- Kendall, P., & Beidas, R. (2007). Smoothing the trail for dissemination of evidence-based practices for youth: Flexibility within fidelity. *Professional Psychology: Research and Practice, 38*, 13-20.
- Kerr, T., Stoltz, J., Marshall, B. D. L., Lai, C., Strathdee, S. A., & Wood, E. (2009). Childhood trauma and injection drug use among high-risk youth. *Journal of Adolescent Health, 45*, 300-302.
- Khalsa, S. B. (2004). Treatment of chronic insomnia with yoga: A preliminary study with sleep-wake diaries. *Applied Psychophysiology & Biofeedback, 29*, 269-278.
- Khalsa, S. B., Shorter, S. M., Cope, S., Wyshak, G., & Sklar, E. (2009). Yoga ameliorates performance anxiety and mood disturbance in young professional musicians. *Applied Psychophysiology & Biofeedback, 34*, 279-289.
- Kilpatrick, D. G., Ruggiero, K. J., Aciermo, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence and comorbidity: Results from the national survey of adolescents. *Journal of Consulting and Clinical Psychology, 71*, 692-700.
- Kinniburgh, K. J., Blaustein, M., Spinazzola, J., & van der Kolk, B. A. (2005). Attachment, self-regulation, and competency. *Psychiatric Annals, 35*, 424-430.
- Korn, D. L. (2009). EMDR and the treatment of complex PTSD: A review. *Journal of EMDR Practice and Research, 3*, 264-278.
- Kreidler, M., & Kurzawa, C. (2009). Trauma spectrum disorders: Clinical imperatives. *Journal of Psychosocial Nursing and Mental Health Services, 47*(11), 26-33.
- Kuttner, L., Chambers, C. T., Hardial, J., Israel, D. M., Jacobson, K., & Evans, K. (2006). A randomized trial of yoga for adolescents with irritable bowel syndrome. *Pain Research & Management, 11*, 217-223.
- Levin, E. C. (2009). The challenges of treating developmental trauma disorder in a residential agency for youth. *Journal*

- of the American Academy of Psychoanalysis and Dynamic Psychiatry, 37, 519-538.
- Lobo, Y., & Winsler, A. (2006). The effects of a creative dance and movement program on the social competence of head start preschoolers. *Social Development, 15*, 501-519.
- Lyons-Ruth, K., Dutra, L., Schuder, M. R., & Bianchi, I. (2006). From infant attachment disorganization to adult dissociation: Relational adaptations or traumatic experiences? *Psychiatric Clinics of North America, 29*, 63-86.
- Macy, R. D., Macy, D. J., Gross, S. I., & Brighton, P. (2003). Healing in familiar settings: Support for children and youth in the classroom and community. In R. D. Macy, S. Barry, & G. G. Noam (Eds.), *Youth facing threat and terror. New Directions for Youth Development* (Vol. 98, pp. 51-79). Hoboken, NJ: Jossey-Bass.
- Moadel, A. B., Shah, C., Wylie-Rosett, J., Harris, M. S., Patel, S. R., Hall, C. B., & Sparano, J. A. (2007). Randomized controlled trial of yoga among a multiethnic sample of breast cancer patients: effects on quality of life. *Journal of Clinical Oncology, 25*, 4387-4395.
- Nemeroff, C. B. (2004). Neurobiological consequences of childhood trauma. *Journal of Clinical Psychiatry, 65*, 18-28.
- Ogden, P., Minton, K., & Pain, C. (2006). *Trauma and the body: A sensorimotor approach to psychotherapy*. New York, NY: W. W. Norton.
- Pearlman, L. A., & Courtois, C. A. (2005). Clinical applications of the attachment framework: Relational treatment of complex trauma. *Journal of Traumatic Stress, 18*, 449-459.
- Pilkington, K., Kirkwood, G., Rampes, H., & Richardson, J. (2005). Yoga for depression: The research evidence. *Journal of Affective Disorders, 89*, 13-24.
- Rain, C., Fyfe-Johnson, A. L., Breuner, C. C., & Brown, M. A. (2010). Randomized controlled clinical of yoga in the treatment of eating disorders. *Journal of Adolescent Health, 46*, 346-351.
- Salmon, P., Lush, E., Jablonski, M., & Sephton, S. E. (2009). Yoga and mindfulness: Clinical aspects of an ancient mind/body practice. *Cognitive and Behavioral Practice, 16*, 59-72.
- Salmon, P., Sephton, S., Weissbecker, I., Hoover, K., Ulmer, C., & Studts, J. L. (2004). Mindfulness meditation in clinical practice. *Cognitive and Behavioral Practice, 11*, 434-446.
- Scaer, R. (2001). *The body bears the burden: Trauma, dissociation, and disease*. Binghamton, NY: Haworth Medical Press.
- Schreiner, I., & Malcolm, J. P. (2008). The benefits of mindfulness meditation: Changes in emotional states of depression, anxiety, and stress. *Behaviour Change, 25*, 156-168.
- Singer, M. I. (2007). Assessment of violence exposure among residential children and adolescents. *Residential Treatment for Children & Youth, 24*, 159-174.
- Spinazzola, J., Ford, J. D., Zucker, M., van der Kolk, B. A., Silva, S., Smith, S. F., & Blaustein, M. (2005). Survey evaluates complex trauma exposure, outcome, and intervention among children and adolescents. *Psychiatric Annals, 35*, 433-439.
- Streeter, C. C., Jensen, J. E., Perlmutter, R. M., Cabral, H. J., Tian, H., Terhune, D. B., . . . Renshaw, P. F. (2007). Yoga asana sessions increase brain GABA levels: A pilot study. *Journal of Alternative & Complementary Medicine, 13*(4), 419-426.
- Tol, W. A., Komproe, I. H., Susanty, D., Jordans, M. D., Macy, R. D., & Jong, J. T. V. M. (2008). School-based mental health intervention for children affected by political violence in Indonesia: A cluster randomized trial. *Journal of Adolescent Mental Health, 300*, 655-662.
- van der Kolk, B. A. (1994). The body keeps the score: Memory and the emerging psychobiology of post traumatic stress. *Harvard Review of Psychiatry, 1*, 253-265.
- van der Kolk, B. A. (2003). Neurobiology of childhood trauma and abuse. *Child and Adolescent Psychiatric Clinics, 12*, 293-317.
- van der Kolk, B. A. (2005). Developmental trauma disorder: Toward a rational diagnosis for children with complex trauma histories. *Psychiatric Annals, 35*, 401-408.
- van der Kolk, B. A. (2006). Clinical implications of neuroscience research in PTSD. *Annals of the New York Academy of Sciences, 1071*, 277-293.
- van der Kolk, B., McFarlane, A. C., & Weisaeth, L. (1996). (Eds.). *Traumatic stress: The effects of overwhelming experience on mind, body, and society*. New York, NY: Guilford Press.
- van der Kolk, B. A., Spinazzola, J., Blaustein, M. E., Hopper, J. W., Hopper, E. K., Korn, D. L., & Simpson, W. B. (2007). A randomized clinical trial of eye movement desensitization and reprocessing (EMDR), fluoxetine, and pill placebo in the treatment of posttraumatic stress disorder: Treatment effects and long-term maintenance. *Journal of Clinical Psychiatry, 68*, 37-46.
- Warner, L. A., & Pottick, K. J. (2003). *Nearly 66,000 youth live in U.S. mental health programs. Latest findings in children's mental health* (Policy Report submitted to the Annie E. Casey Foundation). New Brunswick, NJ: Institute for Health, Health Care Policy, and Aging Research, Rutgers University.
- Wegman, H. L., & Stetler, C. (2009). A meta-analytic review of the effects of childhood abuse on medical outcomes in adulthood. *Psychosomatic Medicine, 71*, 805-812.
- Weierich, M. R., & Nock, M. K. (2008). Posttraumatic stress symptoms mediate the relation between childhood sexual abuse and non-suicidal self-injury. *Journal of Consulting and Clinical Psychology, 76*, 39-44.
- Wilson, J. P., & Keane, T. M. (Eds.). (2004). *Assessing psychological trauma and PTSD* (2nd ed.). New York, NY: Guilford Press.
- Yates, T. M., Carlson, E. A., & Egeland, B. (2008). A prospective study of child maltreatment and self-injurious behavior in a community sample. *Development and Psychopathology, 20*, 651-671.
- Zelechowski, A. D., Sharma, R., Baserra, K., Miguel, J., & DeMarco, M. (in press). Traumatized youth in residential treatment settings: Prevalence, treatment and policy implications. *Journal of Child & Adolescent Trauma*.