YOGA AS AN ADJUNCTIVE TREATMENT FOR YOUTH WHO HAVE EXPERIENCED COMPLEX TRAUMA

by

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ABSTRACT

YOGA AS AN ADJUNCTIVE TREATMENT FOR YOUTH WHO HAVE EXPERIENCED COMPLEX TRAUMA

Jessica Silva, Doctor of Psychology, 2017

Psy.D. Dissertation Chaired by Lourdes Dale, Ph.D.,
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Exposure to childhood trauma is a significant public health concern due to its high prevalence as well as its emotional and physical impacts and resulting societal costs. The term complex trauma encompasses both the chronic, interpersonal nature of trauma exposure and its negative effects on development and functioning. While there are several types of evidence-based treatments (e.g., Trauma-Focused Cognitive Behavioral Therapy, Attachment, Regulation, and Competency), they rely on verbal processing of trauma-related material. Emerging interventions stemming from Complementary and Alternative Medicine (e.g., acupuncture, tai chi, yoga) are more recently being explored in the literature as body-focused interventions.

Trauma-sensitive yoga has gained increasing empirical support in its use as an adjunct treatment for adults impacted by childhood trauma. However, literature supporting its use with children remains very limited. Therefore, this dissertation aimed to assess the impact of a trauma-sensitive yoga intervention on youth who have experienced complex trauma. Twelve participants receiving trauma-focused treatment engaged in a six-week adjunctive trauma-sensitive yoga intervention led by a certified yoga instructor. The participants completed pre- and post-yoga measures assessing their symptoms of posttraumatic stress disorder (PTSD) and various aspects of psychological wellbeing (e.g., everyday functioning, emotional wellbeing, self-concept, emotion regulation, and worldview). There were not significant changes in the

levels of PTSD symptoms from pre- to post-yoga intervention. However, participants with more severe symptoms of arousal, avoidance, negative thoughts, and overall PTSD reported significantly greater improvement in these areas post-yoga.

Trauma-sensitive yoga had a significant positive effect on everyday functioning, emotional wellbeing, severe psychopathology, and worldviews related to controllability and vulnerability. Furthermore, participants who reported poorer self-concept and greater somatization, depression, and psychopathology experienced significant improvement in these areas after yoga. Lastly, participants who reported using more maladaptive emotion regulation strategies (e.g., self-blame, catastrophizing) at baseline tended to use them less frequently, while increasing their use of positive emotion regulation strategies (e.g., positive refocusing, putting into perspective) after yoga. This study offers support for the use of yoga in treatment for youth impacted by trauma and highlights important areas of future study.

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CHAPTER I

INTRODUCTION

Trauma exposure is a significant concern for children and adolescents in the United States (U.S.). The estimated prevalence of trauma exposure is as high as at least one exposure to trauma per lifetime for the majority of people (Bonanno, 2005). According to the National Child Abuse and Neglect Data System (2012), there were an estimated 678,000 cases of child maltreatment within one year in the US, including substantiated cases of neglect, physical abuse, sexual abuse, and psychological maltreatment. This statistic is thought to be an underestimate of the actual incidences of trauma, as it does not account for cases that go unreported. During the same year, the estimated total cost to society in addressing child abuse and neglect was 80 billion dollars (Gelles & Perlman, 2012). This staggering expenditure included direct costs associated with investigations, foster care placements, and acute medical and/or mental health treatment, and indirect long-term costs such as special education services, juvenile delinquency, adult criminality, and chronic medical and mental health problems occurring as a result of early life trauma (Gelles & Perlman, 2012).

Although the monetary costs to society resulting from child abuse and neglect are great, the psychological costs are even more detrimental to the young survivors and their loved ones. Trauma impacts many facets of a child's development, including physiological, behavioral, social, and emotional functioning (van der Kolk, 1996). Exposure to trauma can also result in maladaptive bodily responses to stress such as hyper-arousal, dissociation, and somatization, which are often debilitating to functioning in many aspects of a child's life (Herman, 1997).

These negative effects of trauma tend to become more severe and pervasive as the number of traumatic events that a child or adolescent experiences increases (Dong et al., 2004;

van der Kolk, 2005). Unfortunately, children who experience one form of trauma such as sexual abuse are at an increased risk of experiencing other types of trauma such as neglect or physical abuse (Anda, 2007; Turner, Finkelhor, & Ormrod, 2010). The great majority of traumatic events occur on a chronic basis, meaning that children frequently experience either the same type of trauma repeatedly or more than one type of trauma in childhood (Dong et al., 2004; Kliethermes, Schacht, & Drewry, 2014; Spinazolla et al., 2002). For example, Turner et al. (2010) screened a nationally representative sample of 4,053 youth aged 2 to 17 years old, and found that about 66% of the sample were exposed to more than one form of victimization. The same research found that 30% of children sampled were exposed to five or more types of victimization (Turner et al., 2010). Polyvictimization amongst children can also occur at very young ages, with one study finding that in a sample of 213 children aged 2 to 4 years, 34.7% of children exposed to trauma had experienced two or more types of trauma (Grasso, Ford, & Briggs-Gowan, 2013).

The potential impacts of these traumatic events on children can interfere with healthy development, rendering this population especially vulnerable to ongoing developmental difficulties. Childhood and adolescence are developmental periods where brain and other types development are very sensitive to environmental experiences. Trauma exposure during this time can lead to serious consequences in terms of subsequent personality development and functioning (Kliethermes et al., 2014).

Complex trauma is an emerging term in the field of psychology that was developed to describe both exposure to multiple or prolonged traumatic events, and the pervasive short and long-term impacts of this exposure on daily functioning (Kliethermes et al., 2014; National Child Traumatic Stress Network [NCTSN], 2014). Thus, complex trauma refers to two inter-related constructs: Exposure to ongoing trauma, and the maladaptive adaptations and developmental

outcomes that occur as a result. The most prevalent form of trauma exposure has been found to be interpersonal in nature, and the environment in which victimization most commonly occurs in is the home (Spinazolla et al., 2005). Since complex trauma often happens in the context of the child or adolescent's caregivers, difficulties with attachment and interpersonal relationships often develop (Cook, Blaustein, Spinazzola, & van der Kolk, 2003; Spinazolla et al., 2002). Those with complex trauma also frequently exhibit issues with self-concept, giving way to disturbances of body image, low self-esteem, poor self-efficacy, and intense feelings of guilt and shame (Burack et al., 2003; Cook et al., 2003). In addition, both structural and functional changes in the brain have been shown to occur as a result of chronic trauma exposure (Gabowtiz, Zucker, & Cook, 2008).

Given the pervasiveness of trauma exposure during childhood and adolescence and its associated emotional and financial costs to society, it is imperative to focus on this population when conducting research on treatment outcomes. Current traditional treatments are often limited to a single modality and tend to focus on cognitive processes. These treatment models rely primarily on verbal expression to process the impact of trauma on a child or adolescent's life (Briere & Lanktree, 2008; van der Kolk, 2003; Wylie, 2004). These approaches at times lack success due to the inability to effectively address the complex and wide array of symptoms related to trauma exposure (van der Kolk, 2014; Wylie, 2004). Since trauma often impacts one's body, mind, and interpersonal relationships, the challenges associated with treating symptoms related to trauma are great. A major barrier to treatment is a survivor's difficulty in verbally expressing information related to trauma, often due to the inability to connect with internal experiences, poor emotional awareness, and/or re-experiencing intolerable physiological responses during trauma processing (Briere & Lanktree, 2008; van der Kolk, 1994). In addition,

a survivor's difficulty with engaging in positive relationships and his/her general mistrust of others may impede the development of a strong therapeutic alliance required for effective psychotherapy.

Given the difficulties often faced in traditional treatments, the paradigm for trauma treatment has been shifting towards the integration of alternative mind-body approaches into traditional care to address these physiological impacts (van der Kolk, 2003). More recently, an explosion of research has shown promising findings on the integration of body-focused treatment modalities, such as trauma-sensitive yoga, with traditional therapies (Emerson, Sharma, Chaudhry, & Turner, 2009; van der Kolk, 2003). However, many of these studies have been conducted on adult survivors of childhood trauma. Less is known about the utility of alternative treatments with child and adolescent populations. As a result, there are few empirically supported treatment models for children and adolescents who have experienced complex trauma. This is a troubling fact, as the majority of exposure to trauma occurs early in life. For example, one study found that approximately 38% of participants who had experienced complex trauma were between the ages of 12-21 at the time of exposure (Spinazolla et al., 2005). Increased research and development of interventions targeted towards this population could potentially help to diminish some of the negative effects of complex trauma and improve outcomes.

The current study evaluates the impact of implementing trauma-sensitive yoga as an adjunct for female youth receiving traditional trauma-focused treatment at an outpatient treatment facility. Although the national rates of physical abuse are approximately equal for both male and female children, females are more likely to have experienced neglect and domestic violence as children (Singer, Anglin, Song, & Lunghofer, 1995; U.S. Department of Veterans Affairs, 2014). In addition, the risk of sexual abuse for female youth is greater than

that of male youth, with 1 in 5 girls versus 1 in 6 boys being victims of child sexual abuse (Center for Disease Control and Prevention [CDC], 2014). Thus, many studies conducted with adults who have experienced complex trauma have focused on female survivors. Gender has also been shown to play a role in the development of trauma-related symptoms after exposure, with females having a greater risk than males to develop PTSD or other disorders (Kilpatrick et al., 2003; McDonald, Borntrager, & Rostad, 2014; U.S. Department of Veterans Affairs, 2014).

Given the high prevalence of trauma in the young female population and their higher risk for developing trauma-related symptoms, the current study recruited young female survivors of complex trauma in order to examine the effects of adjunctive trauma-sensitive yoga in improving trauma-related symptoms and overall wellbeing. The next chapter reviews the current literature on the multifaceted impacts of trauma on development, current traditional trauma-focused treatments, and emerging alternative therapies.

CHAPTER II

LITERATURE REVIEW

The following chapter describes the current literature concerning various types of trauma, with a more detailed focus on complex trauma. The numerous impacts of trauma on childhood and adolescent development are discussed. Current treatment models for complex trauma are reviewed in the following section. Consideration for the need to explore complementary and alternative interventions, such as trauma-sensitive hatha yoga, used in conjunction with traditional treatments is also proposed. The basic concepts of complementary and alternative medicine are discussed and a detailed explanation of trauma-sensitive yoga and its therapeutic utility is offered. In addition, a review of current research on the therapeutic effects of yoga with child and adolescent clinical populations follows.

Trauma in American Youth

Single Incident Trauma

In the U.S., numerous children are exposed to single-incident traumas, or one specific type of traumatic event before reaching adulthood. Examples of single incident traumas include experiencing a natural disaster, a sole instance of sexual or physical abuse, witnessing a violent event, experiencing a car accident, or contracting a temporary but serious medical illness (Adler-Nevo, 2005; Duros & Crowley, 2013). The subsequent impacts of single-incident trauma on children and adolescents include various disturbances in behavior, and on occasion the development of posttraumatic stress disorder (PTSD; Adler-Nevo, 2005).

It is fairly likely that a child living in the U.S. will experience at least one potentially traumatic incident before the age of 18. In fact, in a general population longitudinal study conducted in North Carolina on a community sample of 1,420 children, 30.8% of children and

adolescents experienced a traumatic event by the age of 16 (Copeland, Keeler, Angold, & Costello, 2007). One of the most common types of single-incident traumatic events that children and adolescents experience is accidental injury leading to hospitalization (Berry & Harrison, 2007; CDC, 2014). About 2,500 per 100,000 children and adolescents in the U.S. experience an accidental injury requiring hospitalization every year (Berry & Harrison, 2007). Although there is a very high prevalence of injuries requiring hospitalization and other single incident traumas in the U.S., the effects of these incidents on children are largely minor and temporary in nature.

Impact of single-incident trauma. Studies have shown that experiencing isolated traumatic incidents often leads to specific behavioral and physiological reactions to trauma reminders, with some children later developing posttraumatic symptoms (Nixon, Ellis, Nehmy, & Ball, 2010; van der Kolk, 2005). However, the majorities of children exposed to a single traumatic event have a favorable prognosis and do not develop PTSD symptoms. Most children are generally able to continue functioning with adequate parental or other forms of social support (Cook et al., 2003; Copeland et al., 2007). Of the minority who do develop posttraumatic symptoms requiring intervention, most of them show significant improvement in PTSD symptoms after treatment (Copeland et al., 2007). One study demonstrated that 92% of children and adolescents who developed PTSD symptomology after a single incident traumatic event and received Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) no longer met criteria for PTSD after 10 weeks of treatment (Smith et al., 2007). In contrast to single-incident traumatic events, chronic victimization tends to have more pervasive effects on neurobiological and psychosocial development (Stolbach et al., 2013; van der Kolk, 2005). As the frequency and severity of traumatic events increases in a child's life, the consequences on development and overall functioning tend to become more severe (van der Kolk, 2005).

Complex Trauma

The term complex trauma has been coined to encompass both the nature of a survivor's exposure to multiple, prolonged traumatic events and its long-term developmental outcomes (Cook et al., 2003; Herman, 1992; NCTSN, 2014). Children who have experienced complex trauma are often diagnosed with a myriad of diagnoses, with high rates of comorbidity (van der Kolk, 2005). The current PTSD diagnosis is limited in its ability to capture the full spectrum of difficulties experienced by traumatized children (van der Kolk, 2005). There is no existing diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association [APA], 2013) that fully captures the constellation of symptoms often seen in those affected by complex trauma. However, there is growing evidence supporting a proposed psychiatric diagnosis coined Developmental Trauma Disorder (DTD), which offers a more developmentally sensitive and accurate representation of the symptomology of complex trauma (van der Kolk, 2005). This proposed diagnosis is thought to better represent the interpersonal nature of complex trauma exposure and its unique detrimental effects on future development.

Events that constitute complex trauma are often comprised of negative interpersonal experiences (Cook et al., 2003). Types of traumatic experiences included in this working definition are repeated instances of child maltreatment such as neglect, exposure to community and domestic violence, separation from caregivers or other family members, and emotional, physical, and sexual abuse (Cook et al., 2003; Courtois, 2004; van der Kolk, 2005). Exposure to complex trauma typically begins early in life and commonly occurs in the context of the child's relationship with a caregiver (Cook et al., 2003; van der Kolk, 2005). The developmental consequences and symptoms resulting from exposure to such experiences are different than the

impact of acute trauma exposure, and can impact a child's general sense of safety and security (Cook et al., 2003; Kliethermes et al., 2014). Although the incidence of single-incident trauma exposure in the U.S. is high, children are actually more likely to experience multiple types or repeated exposure to trauma than a single episode (van der Kolk, 2005).

Prevalence. The vast majority of trauma exposure in the United States is chronic in nature and includes various, co-occurring types of trauma (e.g., Anda et al., 2006; Cook et al., 2003; Dong et al., 2004, Pynoos et al., 2009). According to the Adverse Childhood Experiences longitudinal study (ACES), 69% of a nationally representative sample of approximately 17,000 adult participants ranging in age from 19 to 90 reported having experienced two or more incidents of childhood trauma (Anda & Felitti, 2003; Felitti et al., 1998). Within this sample, 30.1% reported having experienced physical abuse, 19.9% sexual abuse, 12.5% witnessed their caregiver being battered, and 11.0% reported emotional abuse (Felitti et al., 1998). More recent research has demonstrated that the frequency and intensity of polyvictimization in adolescents has steadily increased over the past several years (Finkelhor et al., 2009). Youth exposed to multiple traumatic events often develop higher levels of trauma-related symptoms, more severe mental and physical difficulties, and higher levels of generalized behavior problems than those who experience single-incident traumas (Finkelhor, Ormrod, & Turner, 2007; Wamser-Nanney & Vandenberg, 2013). Given the pervasive nature of complex trauma exposure, its impact on both immediate and long-term pathways of development is multidimensional and cumulative.

Short-term impact of complex trauma. Complex trauma can adversely affect children and adolescents in several ways that are distinct from the effects of experiencing a single acute interpersonal trauma (Kliethermes et al., 2014; Wamser-Nanney & Vandenberg, 2013). In addition, a single diagnostic label is unlikely to encompass the complexity of posttraumatic

effects for the majority of individuals who have experienced complex trauma (Briere & Spinazzola, 2005; McDonald et al., 2014). Although some youth who experience complex trauma meet the criteria for posttraumatic stress disorder as defined in the *DSM-5* (APA, 2013) many do not qualify for a trauma-related diagnosis. These youth are often diagnosed with other comorbid or co-occurring diagnoses, potentially leading to misinformed and ineffective treatment and interventions (van der Kolk & Pynoos, 2009). Many times they exhibit additional difficulties that are not captured in the PTSD diagnostic criteria, but still cause considerable functional impairment (Cook et al., 2003; van der Kolk, 2005; Wamser-Nanney & Vandenberg, 2013).

The expression of complex trauma-related symptoms can vary widely and depends heavily on factors such as chronicity of trauma, the child's developmental level, available social supports, and the presence of other mental disorders (Breslau, Davis, & Andreski, 1991; Kliethermes et al., 2014). Impairment in functioning seems to be more chronic and severe when trauma exposure has a very early onset, lasts for a long period of time, consists of multiple types of trauma, and is interpersonal in nature (Cohen et al., 2002; De Bellis et al., 1999; Ogle, Rubin & Siegler, 2013; Teicher et al., 2006; van der Kolk, 2005). These impacts are pervasive across all contexts of a child or adolescent's life, including school, work, home, and in relationships with others (van der Kolk, 2005). Common domains affected include neurobiological development (Ford, Courtois, Steele, van der Hart, & Hijenhuis, 2005; van der Kolk, 2005; van der Kolk, 2007), relationships and attachment, affect regulation (van der Kolk, 2005), behavior (Wamser-Nanney & Vandenberg, 2013), cognition, and self-concept (Cook et al., 2003). Although reactions to complex trauma are multifaceted and vary within themselves, there are

symptoms and impacts on daily functioning that are most commonly observed, which are reviewed in detail below.

Neurobiological impact of complex trauma. Neurobiological development is a genetically influenced process that is also mediated by an individual's experiences and the external environment (Cook et al., 2003). During normal development, the thalamus and somatosensory cortices of the brain form to accurately filter sensory input and extrapolate useful information about the environment (Cook et al., 2003). The amygdala and insula, which function to assist in the detection and protective responses to potential threats, also develop in early childhood. In addition, the hippocampus, ventral tegmentum, and striatum develop and function together to create meaningful contexts for environmental experiences while coordinating rapid goal-oriented responses (Cook et al., 2003). Within a healthy environment, brain structures develop and function in a way to adequately meet both long and short-term needs and facilitate complex learning (Kliethermes et al., 2014). However, when development occurs within the context of chronic trauma, such as neglect or ongoing abuse, the brain is thought to overcompensate in particular areas and develops in a way that is conducive to surviving in a traumatic environment (Perry, 2001). Complex trauma impacts the above-mentioned areas of functioning by altering the ability to accurately assess the environment and relationships with others while distorting perceptions, leading to a sequelae of maladaptive functioning (van der Kolk, 2005).

The range in symptoms and reactions to trauma is also influenced by the timing of trauma in relation to the stage of neurobiological development (Pynoos, Steinberg, Ornitz, & Goenjian, 1997). However, there are general neurobiological impacts of chronic traumatization on children and adolescents, which negatively effect the development and functioning of specific brain areas.

Chronic trauma has been shown to interfere with brain development by altering neural proliferation and causing physiological changes of key neural networks associated with responses to stress (Green 2012; Kliethermes et al., 2014; Lanius, Vermetten, & Pain, 2010). Brain organization and activation becomes overly focused on structures that encourage rapid, autonomic responses to avoid harm and regulate arousal, such as the amygdala and brainstem (Kliethermes et al., 2014).

Several other brain regions are also impacted by exposure to trauma, including the limbic system, cortical midline structures, insula, posterior parietal cortex, and temporal poles (Lanius, Blumn, & Frewen, 2011; Rothschild, 2000). The limbic system regulates emotional expression, memory processing, and survival behaviors such as sexual reproduction, eating, and instinctual defenses (Rothschild, 2011). The limbic system is also a part of the hypothalamic pituitary adrenal (HPA) axis, which mediates the body's response to threats to survival commonly referred to as the fight, flight, or freeze response (Porges, 2004; Rothschild, 2011).

When a threat occurs, the sympathetic nervous system (SNS) of a developmentally normal individual works in conjunction with the HPA axis to mobilize resources to face a threat, such as releasing stress hormones like cortisol and adrenaline, increasing heart rate, respiration, and preparing muscles for action (Emerson & Hopper, 2011; Porges, 2004; van der Kolk, 2013). When the danger subsides, the parasympathetic nervous system (PNS) works to halt this activation, returning the body to normal resting state. Together these systems generate a healthy, adaptive survival response in the face of an acute threat. However, in those affected by ongoing trauma, the limbic system and HPA axis are chronically aroused, even when the stressor has passed (Duros & Crowley, 2014; Hanson, 2009; Rothschild, 2011). This persistent arousal of the HPA axis and limbic system is due to the unpredictable and ongoing nature of interpersonal

victimization. Oftentimes, this is experienced as feeling as if one is under constant threat to survival (Kliethermes et al., 2014).

This ongoing hyperarousal is often accompanied by disruptions or distortions in memory, as the amygdala and hippocampus are both highly involved in processing life events and the emotional tone of those events (Rothschild, 2011). The hippocampus' primary function is in the storage and retrieval of memories, which have both explicit and implicit components (Rothschild, 2011). The explicit memory system is mediated by the hippocampus and consists of ideas, facts, and concepts. Explicit memory also demands the use of oral or written language for storage and retrieval (Hanson, 2009; Rothschild, 2011). It allows for the verbal expression of experiences, recall of different aspects of a situation, and extracting meaning out of such experiences (Hanson, 2009; Rothschild, 2011). Conversely, implicit memory, mediated by the amygdala, involves the storage and retrieval of learned behaviors and procedures and does not depend on language (Rothschild, 2011).

During a traumatic event, increases in stress hormones such as cortisol and epinephrine suppress hippocampal activity (Gunnar & Barr, 1998; Rothschild, 2011). Traumatic events are more easily recorded in implicit memory than explicit memory because the amygdala is not suppressed during stressful events, whereas the hippocampus is inhibited (Rothschild, 2011). This can create various distortions in memories related to the traumatic event, such as highly emotionally charged memories that are unclear or blurred (Rothschild, 2011). This dynamic can result in an individual experiencing disturbing emotions and bodily sensations via implicit memory, without full access to the context in which they arose due to the suppression of explicit memory (Rothschild, 2011). Thus, a survivor of trauma may be highly physiologically reactive to any trigger in their environment, while being unable to connect their response to the terrifying

events they previously experienced (Hanson, 2009). This often creates a sense of feeling out of control of one's body, overwhelmed, and in a relentless state of distress (Hanson, 2009; Rothschild, 2011; van der Kolk, 2005).

In addition, trauma interferes with the integration of left and right hemisphere brain processes. A gradual shift occurs in early childhood neurobiological development from primary reliance on right hemisphere function to left hemisphere dominance, where language, reasoning, and planning occur (De Bellis et al., 2002; Kagan, 2003). When trauma ensues, this process of integrating left and right hemisphere functioning is disrupted, often resulting in compromised executive functioning, inaccurate assessment of safety or danger in the environment, and maladaptive physiological reactivity (Cook et al., 2003; Porges, 2004; Saltzman, Weems, & Carrion, 2006). These changes also hinder the capacity for the developing brain to integrate sensory, emotional, and cognitive information into a cohesive whole. This makes it difficult to accurately assess the environment and relationships, and to regulate one's own emotional responses (Ford et al., 2005; van der Kolk, 2005). In addition, difficulty in recovering from heightened physiological states has also been found in trauma survivors, suggesting an impaired ability to shift from mobilized states back into states of calmness (Dale et al., 2009).

Impact of complex trauma on emotion regulation. Chronic trauma has been shown to negatively impact an individual's sense of self-awareness and ability to control his/her own emotions. Studies indicate that adult patients who have experienced chronic childhood abuse have difficulty in recognizing and understanding others' complex emotional states, were unaware of their own emotional responses, and struggle to identify and verbally express emotions (Frewen, Dozois, Neufeld, & Lanius, 2008; Lanius et al., , 2011). Chronic trauma frequently impairs the survivor's ability to tolerate emotional expression and control impulses. Due to this

impairment, children and adolescents often exhibit difficulty in controlling anger and display rapidly vacillating moods and prolonged negative mood states (Bardeen & Read, 2010; Borum, 2003; Cook et al., 2003; D'Andrea, Ford, Stolback, Spinazzola, & van der Kolk, 2012; Kliethermes et al., 2014).

Oftentimes, children who are chronically abused feel unable to use their emotional responses to seek effective escape behaviors, or are physically unable to protect themselves (van der Kolk, 2005). This results in developing a sense of learned helplessness and disconnecting the self from bodily experiences or emotions in an effort to avoid distress that cannot be relieved through action (Lanius et al., 2011). The inability to regulate one's internal experience is related to dysfunctional relationships and interactions with others. It also leads to the development of dysfunctional behaviors described below, such as suicidality (Holmes & Butler, 2009; Zlotnick, Donaldson, Spirito, & Pearlstein, 1997), substance abuse (Grilo et al., 1997; Smith & Saldana, 2013), and impulse control problems (Herpertz et al., 1997).

Impact of complex trauma on behavior. The expression of complex traumatization impairs functioning in every facet of an individual's life, including peer and family relationships, the educational and legal system, and employment (van der Kolk, 2005). Chronic childhood trauma is related to over- and under-controlled maladaptive behavior patterns (Cook et al., 2003; Kliethermes et al., 2014). Over-controlled behavior is a tendency to counteract the helplessness and lack of power that children feel as a result of chronic trauma. This sort of behavior manifests by attempts to regulate behavioral routines that children may have control over, such as being overly rigid with actions such as toileting or food intake, difficulties with changes in routines, and/or compulsive compliance with adults (Cook et al., 2003; Crittenden & DiLalla, 1988; Kliethermes et al., 2014).

Under-controlled behavior is characterized by impulsivity and unmodulated aggression, which is commonly exhibited in traumatized children and adolescents (Cook et al., 2003; van der Kolk, 2005; van der kolk, Perry, & Herman, 1991). Children presenting with under-controlled behavior often act without planning ahead (Streeck-Fischer & van der Kolk, 2000), exhibit avoidance of specific environments or people, and have inappropriate behavioral outbursts such as verbal or physical aggression (van der Kolk, 2005). Other common behavioral difficulties include increased social isolation due to difficulties with interpersonal interactions (Bardeen & Read, 2010; van der Kolk, 2005), and decreased ability to maintain goal-directed behavior, leading to difficulties in reaching goals (Stolbach et al., 2013).

In addition, experiencing ongoing trauma has been associated with delinquent and antisocial behavior in adolescence and into adulthood, such as engaging in violent acts and substance abuse (e.g., Anda et al., 2006; Duke, Pettingell, McMorris, & Borowsky, 2010; Felitti et al., 1998; Grilo et al., 1997). This can sometimes lead to interactions with the juvenile justice system, which has had historically disproportionate rates of court-involved youth who have been exposed to trauma (Felitti et al., 1998). Although there are varying statistics due to definitional issues of complex trauma and the myriad of variables involved, Ford et al. (2012) estimated that 35% of court-involved youth have complex trauma histories. A more recent study found that as much as 90% of court-involved youth had experienced multiple types of trauma in their lifetimes (Dierkhising et al., 2013). Other risky behaviors have also been associated with chronic childhood trauma, such as engaging in self-harm (Kaplan et al., 1999; Griere & Gil, 1998), compulsive sexual behavior (Briere & Elliott, 2003), victimizing others (Kliethermes et al., 2014), and suicidality (Chu, 1992; Courtois, 2004; Felitti et al., 1997; Zlotnick et al., 1997).

Many of the above mentioned behaviors have been referred to in the literature as "overdeveloped avoidance responses," or avoidance activities that provide temporary distractions to stress. These distractions have been termed tension reduction activities due to their intended function of reducing the experience of trauma-related dysphoria (Briere & Gil, 1998; Briere & Spinazzola, 2005). The dysregulated behaviors that chronically traumatized youth engage in are often the child's best attempts to cope with their experiences. However, many of these behaviors often lead to increased risk for further victimization and posttraumatic reactions (Acierno et al., 1999; Kliethermes et al., 2014; Neumann, Houskamp, Pollock, & Briere, 1996; van der Kolk, 2005). Poor interpersonal relationships also tend to naturally develop as a result of maladaptive behaviors, which often occur in social environments.

Complex trauma and interpersonal relationships. As mentioned earlier, complex trauma oftentimes occurs in the context of early interpersonal relationships. The child-caregiver relationship provides the relational context in which children develop models of others, the self, and the self in relation to others (Cook et al., 2003). A healthy attachment relationship positively influences social and emotional functioning and stimulates the brain, improving the overall quality of other brain functions, emotion recognition, and emotional expression (Bateman & Fonagy, 2004; Siegel, 1999; van Dijke, 2008). On the neurodevelopmental level, positive early interactions support the development of neural networks needed for appropriate emotional information processing (van Dikje, 2008). In an interpersonal context, these interactions teach the child that others can be trusted and that their needs will be tended to. Such receptive interpersonal exchanges often result in secure attachment patterns, which can help to ameliorate responses to other traumas by providing a supportive environment (Cook et al., 2003).

When the source of trauma is the child-caregiver relationship, as is typically the case with complex trauma, several domains of interpersonal functioning are affected. Caregivers can over-stimulate the child via abuse behaviors, and/or under-stimulate the child via neglect, causing disrupted attachments and difficulties in developing healthy interpersonal relationships (Kliethermes et al., 2014). These early traumatic experiences are associated with insecure, ambivalent, and disorganized attachment styles; all of which can leave children feeling a general sense of mistrust of the world, vulnerability, and helplessness due to consistently unmet needs (Cook et al., 2003; George & Solomon, 1996). Thus, the sense of safety in exploring one's environment, as well as trust of one's own emotions, relationships, and even of one's own body is broken when a child's caregiver neglects or abuses them (Cook et al., 2003; Dorahy et al., 2013).

Children who have experienced complex trauma often lack a sense of safety in their relationships, which is related to the lack of a secure base in their primary caregiving relationships to serve as a model for future social interactions (Kliethermes et al., 2014). Complexly traumatized children's view of the world is framed around their experiences of betrayal and pain early in life, and so they tend to expect the trauma to recur again. Thus, relationships with others are often organized around the anticipation of victimization or rejection, resulting in a range of behaviors such as excessive attachment or clinginess, oppositional defiance, and preoccupation with revenge (Stolbach et al., 2005; van der Kolk, 2005). Mistrust and poor social skills stemming from a fragmented working model of self and others make it extremely difficult to develop genuine and supportive connections, leaving children and adolescents seeking out other familiar but dysfunctional relationships (Kliethermes et al., 2014). Unfortunately, this also contributes to the increased risk of future revictimization later in life for

children and adolescents who've experienced complex trauma (Fleming et al., 1999; van der Kolk, 2005).

From a psychosocial developmental perspective, these impacts are particularly relevant during adolescence due to the emerging importance of forming a sense of identity, and maintaining important social connections such as peer and romantic relationships (Berger, 2008). The increased risk of revictimization during this already developmentally challenging time, especially teenage dating violence, has been demonstrated in studies examining the associations between childhood maltreatment and adolescent relationships (Hamby, Finklehor, & Turner, 2012). These relational difficulties can greatly impact self-concept, with children and adolescents often developing negative perceptions of themselves, which may become reinforced through negative relationships and interactions with the world.

Impact of complex trauma on self-concept and worldview. If a child develops within a nurturing environment and has a responsive caretaker, the child is likely able to develop a competent and worthy self-view. However, chronic early life traumatic experiences adversely fragment a survivor's felt sense of self (Frewen, Bluhm, & Frewen, 2011). One study examined self-descriptiveness ratings for negative and positive (unlovable, despicable versus loveable, special) traits in patients with PTSD and found that they endorsed more negative and fewer positive adjectives about themselves (Frewen et al., 2011). This supports common clinical observations that those who have experienced trauma often hold intense negative thoughts about themselves related to the repetitive incidents of harm or rejection at the hands of caregivers or other significant figures (van der Kolk, 2005; Winter, 2007).

Children develop beliefs about themselves and their self-worth partly from reactions of others in their environment. Since complex trauma often occurs in the context of formative

caregiving relationships, those who are chronically abused or neglected often feel helpless, powerless, unlovable, and unworthy of being helped (e.g., Briere & Spinazzola, 2005; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; Kliethermes et al., 2014; Winter, 2007). Increased self-blame and even self-hatred is also associated with chronic childhood victimization (Foa et al., 1999; Frewen et al., 2011). These negative attributions about the self inherently lead to poor self-image, low self-esteem, and generalized feelings of shame (Briere & Spinazzola, 2005; Rothschild, 2000). Such a poor and detached sense of self often leave survivors experiencing their bodies as bad, damaged, uncontrollable, and unsafe (Arnella & Ornduff, 2000; van der Kolk, 2005; Westerlund, 1992).

In addition to negative self-perceptions, generalized dissociation commonly occurs among those who have experienced complex trauma. These dissociative experiences lead to a detached or fragmented sense of self. The dissociative response during a single traumatic event is a self-protective survival mechanism that involves separating one's awareness from the experience of a traumatic event (Herman, 1997; Rothschild, 2000; Terr, 1991). Those who have experienced trauma often report feeling as if they were outside of their bodies and that the trauma was not actually happening to them (Herman, 1997). This shift in awareness serves to distort and numb one's perceptions, buffering and protecting them from the unbearable impacts of the experience.

Similarly, in environments where a child's needs are chronically neglected and/or there is ongoing abuse and fear, dissociation can also occur as a generalized coping mechanism (Dorahy et al., 2013). In fact, dissociation has been found to be more severe in those who have experienced complex trauma versus individuals diagnosed solely with PTSD (Zucker et al., 2006). When children are not attended to and nurtured by a devoted caregiver, they disconnect

emotionally from the caregiver and become deeply absorbed in their own internal experiences. Likewise, when children are living in a state of fear of their environment due to constant threat of abuse, dissociative freeze responses serve to disconnect and protect the child from the fearful stimulus, which is typically an abusive caregiver (Dorahy et al., 2013).

Although adaptive during actual threatening situations, generalized dissociation prevents the normative process of integrating memories and experiences to form a cohesive sense of self (Fischer et al., 1997; Rothschild, 2000). This unresponsiveness to the present results in a failure to develop a consistent self-identity and feeling as if one's body does not belong to them (Briere, 2002; van der Kolk, 1996; van der Kolk, 2005). Many survivors of complex trauma report feeling overwhelmed with trauma-related sensations when asked to focus on internal experiences within their bodies (van der Kolk, 2005).

In addition, survivors also report feeling a sense of emptiness or unable to experience an inner sense of themselves (Attias & Goodwin, 1999; van der Kolk, 2005). This lack of access to internal states is known as alexithymia, and renders trauma survivors unable to execute appropriate responses to stress (McLean et al., 2006; van der Kolk, 2005; van der Kolk & Ducey, 1989). The sense of detachment from the self leads to the inability to effectively tend to the present moment (Emerson & Hopper, 2011; van der Kolk, 1996). This also hinders an individual's capacity to remain present when interacting with others (Lyons-Ruth, 2003).

Similar to the disruption in formation of self-concept, chronic experiencing of trauma can also alter an individual's perception of the world. The interpersonal difficulties discussed earlier can be attributed to the maladaptive and inaccurate perception of others as potentially unsafe. These challenges are related to an overarching general attribution of the world as a threatening place. Porges (2004) first introduced the concept of neuroception, which describes how neural

circuits within the brain distinguish whether situations or people are dangerous or safe. The Polyvagal Theory states that mammals have evolved structures within the brain that regulate defensive and social behaviors, as well as the process of neuroception (Porges, 2004). According to the Polyvagal Theory, there are three developmental states of a mammal's autonomic nervous system: Social engagement (e.g., vocalization, listening, facial expressions), mobilization (e.g., fight-flight behaviors), and immobilization (e.g., behavioral shutdown; Porges, 2003, 2004). Each state is associated with one of two subsystems located in different branches within the vagus nerve. The stimulation of each is related to either activation or inhibition of defense systems and social engagement. Thus, faulty neuroception, or the inaccurate assessment of safety in a given environment, may contribute to maladaptive and defensive behaviors often found in traumatized populations.

This theory is helpful in explaining the difficulties within various psychiatric disorders in which social engagement is often compromised, including PTSD. If development occurs in the context of a traumatic environment, an individual's neuroception also forms in such a way that mobilization and/or immobilization are the primary states, which optimize the detection of safety and responses critical for survival (Porges, 2003). Thus, maltreated children develop in such a way that the brain inaccurately evaluates risk in his/her environment. Thus, experience biologically alters how the world is viewed and experienced, with traumatized children often learning to view others and the world as unsafe and dangerous. Both this biologically driven distrust of the world and lack of connection to internal experiences contributes to the detrimental effects of complex trauma on overall functioning, and some negative long-term implications have also been studied.

Potential long-term impact of complex trauma. Due to the pervasive and enduring nature of complex trauma reactions, long-term health consequences have been found in children who have experienced complex trauma. There are several mediating risk and protective factors that influence clinical outcomes for those with complex trauma exposure. Individual and contextual risk factors include low intelligence quotient, externalizing characteristics, family adversity, and chronic environmental stressors (Kliethermes et al., 2014; Koenen et al., 2007). Protective factors that can contribute to improvement in outcomes and healthy psychological development despite being traumatized include inherent resiliency, and forming a restorative and secure attachment with a caregiver (Courtois, 2004; van der Kolk, 2005).

Despite the variance in developmental outcomes for complex trauma exposure, relationships have been found that suggest an increased likelihood for a variety of risky behaviors later in life. For example, Felitti et al. (1998) found in the longitudinal ACES study that there are significant positive correlations between childhood trauma exposure and adult engagement in both high-risk behaviors and maladaptive coping mechanisms such as unprotected sex, cigarette smoking, alcoholism, drub abuse, and suicide attempts (Felitti et al., 1998). In addition, many children exposed to complex trauma often experience other lifelong problems such as psychiatric and addictive disorders, chronic medical illness, and obesity in part due to utilizing maladaptive coping mechanisms over an extended period of time (Anda & Felitti, 2003; Cook et al., 2003; Felitti et al., 1998). Legal, vocational, and family problems in adulthood were also more likely to occur in those who have experienced complex trauma as a child (Cook et al., 2003; Felitti et al., 1998).

Consequently, the ACES study found that the more adverse childhood experiences individuals reported, the more they were susceptible to multiple health risk factors later in life,

such as heart disease, cancer, stroke, diabetes, liver disease, skeletal fractures, (Felitti et al., 1998), and early mortality due to seeking out unhealthy coping mechanisms (Brown et al., 2009). Many of these health risk factors are major contributors to the top leading causes of death for adults aged 18-65 in the United States in 2007 (CDC, 2014; National Institute of Mental Health, 2007). In fact, individuals who reported six or more adverse childhood experiences In addition, multiple other studies have demonstrated various graded relationships between experiencing chronic physical abuse and neglect during youth, and numerous social problems later in life (Anda et al., 1999; Anda et al., 2002; Anda et al., 2009; Chapman et al., 2011; Hillis et al., 2000). Thus, the widespread and long-term impacts of childhood trauma can potentially lead to a multitude of physical health and social problems that impact both the individual and society as a whole (CDC, 2007).

Section Summary

Research on complex trauma exposure has demonstrated a multitude of potential developmental outcomes, including alterations in brain development, difficulties with affective and behavioral regulation, disrupted attachment and relationships, and a fragmented sense of self. These outcomes can lead to pervasive and enduring functional impairments throughout a child or adolescent's life. There are a number of evidence-based treatment modalities currently available that aim to address these areas of impairment. The following section is a review of several evidence-based treatment models for children and adolescents who have experienced chronic traumatization.

Evidenced-Based Treatments and Promising Practices

There are numerous treatment modalities that are used with children and adolescents who have experienced multiple traumas. Many are traditional psychotherapy approaches, and some

also include elements of mind-body interventions. These include the Attachment, Self-Regulation, and Competency framework (ARC; Blaustein & Kinniburgh, 2010), Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006), Real Life Heroes (Kagan, 2007), Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS; Habib, Labruna, & Newman, 2013), and Trauma Adaptive Recovery Group Education and Training (TARGET; Ford & Russo, 2006). Research has supported the use of phase-based approaches when treating those affected by complex trauma (Cook et al., 2003; Ford et al., 2005; Herman, 1992). The following treatment modalities utilize phase-based approaches in which treatment occurs sequentially. As will be evident below, these models have varying levels of empirical support.

Attachment, Regulation, and Competency (ARC)

ARC is a relatively new strength-based framework that is a promising treatment for children and adolescents who have experienced chronic traumatic stress or multiple traumas (Blaustein & Kinniburgh, 2007, 2010). Oftentimes, interventions for youth who have experienced trauma focus primarily on reducing posttraumatic symptoms, while largely overlooking the primary caregiving system (Blaustein & Kinniburgh, 2007). In order to address this important element of treatment, ARC has been grounded in the principles of attachment theory and early childhood development. Thus, ARC directly prioritizes interventions that increase the capacity of the caregiving system to support healthy development (Blaustein & Kinniburgh, 2007). This framework acknowledges contextual variables important to address in treatment, such as developmental deficits and/or competencies, familial strengths and/or vulnerabilities, and internal and/or external resources (Kinniburgh, Blaustein, Spinazolla, & van der Kolk, 2005). ARC is organized around three core domains commonly impacted in complex

trauma that are pertinent to future resiliency (Kinniburgh et al., 2005). Each domain contains several building blocks and key concepts that clinicians can choose from in order to target specific areas of functioning for intervention.

The first domain in the ARC framework is attachment, which describes the interaction between caregivers and children. The attachment relationship influences the emergence of early working models of self and identity development, as well as the capacity to regulate emotions (Kinniburgh et al., 2005). This domain is particularly important because it has long been known that the majority of maltreated children and adolescents have insecure attachment patterns due to caregiver abuse, multiple separations and/or abandonment, and/or inconsistent responsiveness of caregivers stemming from their own trauma histories (e.g. Carlson, Cicchetti, Barnett, & Bramwald, 1989; Kinniburgh et al., 2005; Main, 1996).

Keeping this principle at the forefront of treatment, interventions often extend beyond the individual child into the caregiving system. The overarching goals for interventions in the attachment domain are to build healthy attachments between caregiver and child, and to create a safe, structured, and predictable environment for healthy recovery (Kinniburgh et al., 2005). The key building blocks of the attachment domain that seek to achieve these goals are caregiver affect management, attunement, consistent response, and routines/rituals (Kinniburgh et al., 2005). Some examples of interventions in this domain are providing psychoeducation to parents around children's adaptations to trauma, improving parent's ability to appropriately manage their own affect, increasing parent's capacity for accurate attunement, and helping parents to consistently respond children's distressing behaviors (Arvidson et al., 2011).

In addition to disruption in attachment with primary caregivers, traumatized youth are also frequently unable to maintain awareness and self-regulate bodily states and affect (van der

Kolk, 2005). The second domain of ARC, self-regulation, addresses this area of concern via three building blocks: Affect identification, affect modulation, and affect expression (Kinniburgh et al., 2005). These key areas support youth by helping them to build a vocabulary to accurately express their emotional experiences, develop concrete strategies to manage affect, identify safe emotional resources, and effectively communicate their inner experiences to others (Kinniburgh, 2005). These goals are important in fostering positive future attachments with others and in improving the capacity to regulate internal experiences (Blaustein & Kinniburgh, 2007).

Similar to disrupted emotional regulation, youth who have experienced trauma have also spent much of their lives investing energy into surviving rather than developing age-appropriate competencies (Blaustein & Kinniburgh, 2007). Thus, the third domain of the ARC framework is competency, which addresses this issue by going beyond managing posttraumatic symptoms to building mastery of developmental tasks. The two key components of this domain involve improving executive functioning and fostering identity development (Kinniburgh, 2005). In this domain, youth are supported in developing an understanding of the links between actions and outcomes and in evaluating choices. Youth are also encouraged to create a narrative of their life, explore positive and unique personal characteristics, develop social skills, and achieve independence responsibly (Arvidson et al., 2011; Blaustein & Kinniburgh, 2007).

Although ARC has been grounded in well-established theory and evidence-supported treatment methods, the empirical support for the use of the ARC framework itself is limited due to its relatively recent development. A preliminary study was conducted in Alaska on 50 children aged 3-12 who varied widely in ethnic identity and who all had a history of chronic trauma exposure and were involved with child protective services (Arvidson et al., 2011). Outcomes analyses of the youth who completed outpatient treatment (n = 26) via the ARC

framework found that posttraumatic symptoms and behavioral difficulties as measured by the Child Behavior Checklist (CBCL; Achenbach, 2001) significantly improved after treatment (Arvidson et al., 2011). In addition, those who completed treatment successfully were also significantly more likely to be placed in a permanent home (e.g., via adoption or permanent placement with relatives) or reunified with their biological parents (Arvidson et al., 2011). This study shows promise for the generalizability in ethnically diverse populations and the effectiveness of ARC in a naturalistic treatment setting with children. However, it was a small pilot study without controlled trials, which limits the generalizability and validity of the findings. In addition, this study did not utilize any adolescents in their clinical sample, limiting the applicability of results to younger school-aged children.

A more recent study conducted by Hodgdon, Kinniburgh, Gabowitz, Blaustein, and Spinazzola (2013) applied ARC with complexly traumatized children and adolescents in residential treatment facilities. The ARC framework was integrated across both clinical individual and group settings and milieu programming over a span of six months with 124 youth aged 2-19 years old. Preliminary findings suggested that youth who received the ARC intervention displayed significant decreases in PTSD symptomology, aggression, attention problems, rule breaking behaviors, depression, and other domains as measured by the CBCL (Achenbach, 2001). There was also a modest degree of observed clinical change, as evidenced by evolving topics discussed in therapy sessions, and a significant reduction in the use of physical restraints across the span of the study (Hodgdon et al., 2013).

These studies have produced promising evidence for the effectiveness ARC in naturalistic treatment settings with young children and adolescents. However, there have not been any systematic controlled treatment outcome studies to date that examine the efficacy,

effectiveness, feasibility, and flexibility of the ARC framework compared to other established trauma-focused treatment models or to treatment as usual. Thus, although ARC appears to be a potentially useful treatment modality for youth who have experienced complex trauma, much more research would need to be conducted to establish its effectiveness as an evidence-based treatment. The following section discusses TF-CBT, a trauma-focused treatment model that has received significant empirical support.

Trauma Focused Cognitive Behavioral Therapy (TF-CBT)

The most researched and widely used form of therapy that addresses the multiple impacts of trauma is TF-CBT, which is an empirically supported and components-based treatment for children, adolescents, and adults aged 3-25 (Cohen, Mannarino, & Deblinger, 2012). TF-CBT was originally designed to treat children who have experienced sexual abuse (Cohen & Mannarino, 2008; Cohen, Mannarino, & Deblinger, 2006). This model has since been implemented and modified to address the impact of various forms of trauma on children and adolescents, including childhood traumatic grief and chronic victimization (Cohen et al., 2006; Cohen, Deblinger, Mannarino, & Steer, 2004). While TF-CBT was not initially developed for complexly traumatized youth, the model has been adapted and applied to meet the intensive needs of this population, as well as for other specialized populations such as youth affected by traumatic grief, youth with developmental challenges, and military families (Cohen, Mannarino, & Deblinger, 2016).

TF-CBT is rooted in traditional cognitive behavioral theory and addresses several core issues related to the impact of trauma on emotions, behavior, and cognition (Cohen et al., 2006). These areas of potential impairment are addressed via components based on the acronym PRACTICE (Cohen & Mannarino, 2008). The PRACTICE skills-based components are

psychoeducation, parenting/caregiver skills, relaxation, affective modulation, cognitive coping, trauma narrative, cognitive processing, *in vivo* mastery of trauma reminders, conjoint parent-child sessions, and enhancing safety and future developmental trajectory (Cohen & Mannarino, 2008). The components of PRACTICE are delivered via a phase-based treatment approach, with the stabilization, trauma narrative, and integration/consolidation phases. The components and phase of treatment were developed to serve as a framework where the therapist works with both youth and non-offending parents to decrease trauma-related symptomatology and improve overall functioning. TF-CBT can be completed in as little as 12 sessions, with typical length of treatment ranging between 8-16 sessions (Cohen, Mannarino, & Deblinger, 2017). There is no standard number of sessions required since each client's experiences and progress are unique (Cohen et al., 2010).

In youth affected by complex trauma, TF-CBT implementation may take much longer, as these youth often enter treatment while living in chaotic living environments. These environmental factors along with a variety of other chronic difficulties often impede the development of a therapeutic relationship and treatment progress (Cohen et al., 2012). In addition, treatment goals are often fundamentally different due to the inability to achieve "pre-trauma" functionality, as many of these youth do not know a life other than one filled with ongoing, unpredictable traumatic events.

The first phase of treatment is the stabilization phase, which encompasses the first 5 initial components of PRACTICE. These focus primarily on psychoeducation and teaching various skills in order to improve both clients' and parents' ability to cope with trauma-related triggers and prepare clients to complete and process the trauma narrative. Psychoeducation around the physiological, behavioral, and affective effects of trauma is first provided to parents

and children as a means to normalize the child or adolescent's responses to traumatic events. This intervention in itself helps to provide relief and reduce stigma associated with experiencing the trauma. Parents learn and practice various parenting strategies to address many of the affective and behavioral difficulties often found in children and adolescents who have experienced trauma, such as behavioral outbursts and mood swings. These strategies include positive praising, providing a supportive and structured home environment, and selective attention (Cohen et al., 2006).

The relaxation component follows, in which relaxation skills are taught to help children and adolescents feel a greater sense of control over their physiological responses to trauma. There are a variety of skills presented as possible means to reduce disturbing physiological sensations associated with trauma, such as hypervigilance and agitation. Which tools are taught depends on each client's unique needs and developmental level, and can include techniques such as deep breathing exercises and progressive muscle relaxation (Cohen et al., 2006). Therapists have also included meditation and mindfulness practices, and aerobic body-based interventions such as exercise and yoga, which are known to diminish symptoms of anxiety and depression and decrease stress (Cohen et al., 2006).

After this component is affective modulation, in which the therapist helps children and adolescents broaden their range of affective expression, which may have become constrained by traumatic event(s). Various strategies are utilized to help clients learn to identify feelings and appropriately express and modulate them, such as by playing games or role-playing. Once clients have shown improvements in affect modulation, the cognitive coping component helps the child recognize the interconnectedness between feelings, thoughts, and behaviors. Within this component, children and adolescents' learn how to assess the accuracy and usefulness of

their thoughts. Maladaptive thoughts are targeted for further intervention to assist children and adolescents in challenging and modifying them to more helpful and/or adaptive thoughts when confronted by difficult feelings or triggers (Cohen et al., 2006). Once clients are able to adequately cope with triggers and challenge negative thoughts, they are able to move on to the trauma narrative component of treatment, which is arguably the most crucial of all the components of TF-CBT.

Once these initial components have been completed, the client enters the trauma narrative phase, composed of the trauma narrative component of PRACTICE. This is introduced as a way to gradually expose children to discussing their traumatic experiences in a therapeutic context. One major goal for creating the trauma narrative is for the client to separate and distinguish thoughts or reminders of the traumatic event from their associated overwhelming negative emotions such as shame, rage, or terror (Cohen et al., 2006). There are various modalities that can be used to create the narrative, such as writing a story or poem, drawing, music, and other creative means. The most common way to develop the trauma narrative is by having the child or adolescent create a book over several sessions in which their story about the trauma is told through various chapters (Cohen et al., 2006).

Once the narrative is complete, the client enters the final integration/consolidation phase, which consists of the final 3 PRACTICE components. *In vivo* mastery and cognitive processing component encourages the child or adolescent to read their story aloud to the therapist while including related thoughts and emotions during each event. During this time, the therapist utilizes cognitive-processing techniques to correct any cognitive distortions related to the traumatic event, such as thoughts of being at fault for the trauma (Cohen et al., 2006).

Following these sessions with the therapist, it is important to provide the client with the opportunity to share their narrative with their caregivers in conjoint parent-child sessions. This encourages open and meaningful communication between caregivers and children about the trauma, and allows caregivers to practice positive parenting skills to reassure and comfort children. Caregivers must also be adequately prepared by the therapist to hear the narrative in their children's own words, which can often take several individual parent sessions to accomplish. Upon successful sharing of the trauma narrative by the child or adolescent, the final component of treatment involves safety planning for the future and learning new skills to enhance safety, such as identifying trusted adults to turn to for help (Cohen et al., 2006).

There is an abundance of research supporting the efficacy of the PRACTICE components of the TF-CBT model in treating youth affected by various forms of trauma (e.g., Cohen et al., 2004; Deblinger, Mannarino, Cohen, Runyon, & Steer, 2010; Lang et al., 2010). However, TF-CBT has not been rigorously researched to the same extent to determine its efficacy in specifically treating children and adolescents affected by complex trauma.

One recent study by Cohen et al. (2012) proposed an adjusted version of TF-CBT in which the PRACTICE components are delivered in therapy in an altered order. In this version, the enhancing safety component, typically completed towards the end of treatment, is the first component in order to address initial safety concerns and stabilize the client and caregiver early in treatment (Cohen et al., 2012). The primary rationale for this shift in treatment phases is that youth affected by complex trauma often enter treatment with ongoing threats to stability and overall safety, thus beginning treatment with this component helps to strengthen rapport while reducing risky environmental factors and behaviors (Cohen at al., 2012).

Although there are numerous studies that included youth affected by complex trauma in their samples, there are much fewer studies that have focused solely on this population. The little that have utilized samples exclusively comprised of youth affected by complex trauma did demonstrate TF-CBT's efficacy in improving PTSD symptoms and preventing further disruptions in living placements (Cohen & Mannarino, 2011; Weiner, Schneider, & Lyons, 2009). However, these studies utilized relatively small sample sizes, had limited assessments to ensure TF-CBT treatment fidelity, and have been only preliminary in nature.

In addition to the limited evidence for TF-CBT treatment's efficacy in treating complex trauma, limitations of the treatment model itself include its primary focus on talk therapy and cognitive processing. Many interventions in TF-CBT rely upon verbal disclosure and discussion of traumatic experiences and associated feelings based on cognitive and behavioral techniques and theory (Cohen et al., 2012). It has already been recognized in the literature that traumatic experiences alter the physiological processing of memories, resulting in unclear and fragmented memories of events that are often accompanied by strong negative emotional and physical sensations (Duros & Crowley, 2014; Ogden, 2013; van der Kolk, 2014; van der Kolk & Fisler, 1995). Despite this knowledge base, there remains a heavy emphasis on verbal discussion and processing of traumatic memories in TF-CBT. In many cases, trying to recall ambiguous memories can lead to further confusion and is often ill advised (Duros & Crowley, 2014).

In addition, there is little utilization of the physical body as part of the healing process in TF-CBT despite the explosion of recent neurobiological research on the impact of trauma on brain and bodily functioning. The only exception to this is the relaxation component, which teaches clients to utilize stress management techniques such as deep breathing and progressive muscle relaxation to cope with stress (Cohen et al., 2006). However, the remaining components

of TF-CBT focus primarily on cognitive restructuring via the use of the trauma narrative, identifying and challenging cognitive distortions, and reliance verbal communications in therapy sessions. The following section outlines another evidence-based treatment model that is similar in many ways to TF-CBT.

Trauma Affect Regulation: Guide for Education and Therapy (TARGET)

TARGET was initially developed as a parallel treatment for PTSD and substance abuse disorders in adults in order to address the lack of existing psychotherapy approaches for co-occurring PTSD and addiction (Ford & Russo, 2006). It is a manualized treatment modality that can be utilized in both group and individual therapy settings. Since its development, TARGET has been modified to provide developmentally appropriate treatment for children and adolescents, and many outcome studies have supported its use with this population, including its use with males, females, and a variety of ethnic populations and other cultural factors (e.g., Ford & Hawke, 2012; Frisman, Ford, Lin, Mallon, & Chang, 2008).

TARGET focuses on resilience and rebuilding adaptive skills that clients possess rather than client's deficits or failures (Ford & Russo, 2006). Similarly to TF-CBT, TARGET provides psychoeducation around the biological effects of PTSD, teaches clients various self-regulation skills, and involves the creation of a narrative referred to as a lifeline (Ford & Russo, 2006). Grounded in the basic principles of physiological responses to stress, the TARGET model conceptualizes PTSD and other trauma-related symptoms as the body's natural alarm system responding to its environment in a way that is no longer adaptive for the individual (Ford & Russo, 2006). Thus, the overarching goal of treatment is to reset or recalibrate the body's internal alarm system to respond to stressors in a more adaptive manner. Utilizing this positive

approach allows for normalization of symptoms and decreases in self-blame for trauma survivors.

This strength-based treatment method utilizes a skill sequence characterized by the acronym FREEDOM. These incremental steps are: focus on present feelings to reduce anxiety, recognize triggers, identify emotions, evaluate recurring thoughts, define primary goals, identify a choice one makes to reach goals, and make a contribution towards core values (Ford & Russo, 2006). These incremental steps are delivered in phases, with Phase 1 involving teaching the SOS acronym (slow down, orient, self-check) and rating stress levels according to subjective units of distress (SUD) to help focus on internal states and learn to stabilize themselves. The SOS self-cue helps clients interrupt their own automatic reactive thoughts and facilitates cognitive processing. Utilizing learned self-regulation skills, clients familiarize themselves with their physical sensations and increase their own awareness and perception of personal control.

Once clients are ready, Phase 2 incorporates the remaining "REEDO" steps, and is where trauma processing occurs in the context of current life experiences via the lifeline exercise (Ford & Russo, 2006). This intervention is a creative autobiographical narrative that places traumatic experiences within their larger life context. This further normalizes the experience of trauma-related symptoms by reframing traumatic experiences and exploring how existing trauma symptoms are simply healthy survival adaptations that have become generalized to the point of distress and dysfunction (Ford & Russo, 2006). The final phase incorporates all that has been learned in the previous two phases to assist clients in reaching their overarching life goals. Previous steps from the FREEDOM acronym are revisited as needed to help clients identify how they have already been taking positive steps towards their goals and values.

TARGET has been modified into various forms to address the unique needs and presenting concerns of specific subpopulations across different settings. Examples of such variations are TARGET-DV for adults in recovery from domestic violence, TARGET-I for individual psychotherapy for adult survivors of abuse, and TARGET-A for adolescents and pre-adolescent trauma survivors (NCTSN, 2014). TARGET-A was designed to specifically address the unique developmental issues that adolescents typically face, such as balancing autonomy and relationships, identify formation, and managing peer pressure (NCTSN, 2014). It has been implemented in various community settings, such as schools, juvenile detention facilities, and in individual psychotherapy. Pilot studies of the TARGET-A intervention in juvenile justice probation clients ranging in age from 10-18 demonstrated reductions in PTSD avoidance symptoms, negative trauma-related cognitions and coping, and increased self-efficacy and feelings of hope (Ford & Hawke, 2012; Frisman et al., 2008).

TARGET approaches treatment in a fundamentally different manner than does TF-CBT, which emphasizes creating and processing the trauma narrative as a form of gradual exposure (Cohen et al., 2006). Rather than focusing primarily on the cognitive distortions that may have arisen in response to trauma, TARGET is client-centered and focuses more heavily on reframing traumatic events and supporting clients in reaching goals, facilitating a greater sense of purpose and meaning in a client's life (Ford & Russo, 2006). However, like TF-CBT, TARGET's treatment modality is primarily centered around verbal discussions and re-conceptualizing traumatic events into the larger life context. Although there seems to be greater emphasis on educating clients on the role of physiological responses to stress and learning to manage strong affective states, the primary treatment approach is via verbal exploration of cognitive and emotional processes.

Thus, like TF-CBT, TARGET only peripherally involves the body in the therapeutic process, despite the fact that many trauma-related symptoms are somatically based (van der Kolk, 1994). These forms of treatment are often referred to in the literature as "top-down" processing, since they utilize language as the primary modality to process traumatic experiences via cognitive processes such as meaning making and problem solving (LeDoux, 1996; Ogden et al., 2006). However, because traumatized individuals often experience difficulty in effectively using executive functioning due to the high intensity of trauma-related emotions and bodily reactions, other types of psychotherapies have been developed that focus on the physical body as the primary target of intervention. These therapeutic approaches address the difficulties in cognitive and emotional processing that result in rigid overgeneralizations and emotional instability by utilizing "bottom-up" processing (Ogden et al., 2006). One form of such therapy that more directly addresses the physiological effects of trauma is sensorimotor psychotherapy.

Sensorimotor Psychotherapy

Sensorimotor psychotherapy builds upon traditional psychotherapeutic models of trauma by approaching the body as the primary target for intervention. This approach integrates various theoretical principles from both mental health and body psychotherapy traditions, including psychodynamic and cognitive-behavioral therapies, the fields of neuroscience and attachment, and the Hakomi method (Ogden et al., 2006). The Hakomi method is a therapeutic approach pioneered by Ron Kurtz in the 1970's that incorporates mindfulness and compassion as fundamental principles of healing (Kurtz, 1990). Through teaching mindfulness skills, sensorimotor psychotherapy guides clients to become more self-aware of bodily sensations in the present moment via tracking and observing the relationship between physical presentation and underlying beliefs and emotions (Ogden et al., 2006). For example, clients are taught how their

physical posture, movements, and sensations shape and influence their emotional states and the language used to describe such emotions.

In sensorimotor psychotherapy, bodily movement is viewed as the entry point into trauma work, which also integrates emotional and cognitive processing. Thus, much like thoughts are often tracked in cognitive-oriented therapies, physical sensations and bodily movements, such as motor impulses, trembling, and changes in heart rate and posture, are mindfully tracked in sensorimotor therapy (Ogden & Minton, 2000). Sensorimotor work serves as the foundation for bottom-up processing, beginning with fixed, automatic active defenses based in the more primitive lower subcortical brain structures. This basic form of processing is most commonly found in children, and eventually evolves into top-down processing as the predominant form of understanding the world as one develops throughout the lifespan.

The physical defenses that are targeted during bottom-up processing in sensorimotor psychotherapy include heightened awareness and scanning of the environment, reflexive movements used to regain balance, twisting out of another person's grip, or lifting an arm to block a blow to the body (Ogden & Minton, 2000). When described by a traumatized individual, these bodily sensations are often initially defined by emotionally charged words, such as "panic" or "terror." In sensorimotor psychotherapy, clients are taught to more clearly distinguish between physical and emotional states by describing the physical sensations behind the panic or terror, such as feeling tightness, numbness, or trembling (Ogden & Minton, 2000). Once clients can better differentiate between physical and emotional sensations, mindfulness techniques can then be utilized to further increase awareness of changes that occur within the body. Greater attentiveness towards one's inner experiences tends to open the channels towards further integration of both emotional and cognitive processing (Ogden & Minton, 2000).

Building upon the premise of bottom-up processing as the primary modality of organizing information in youth, sensorimotor psychotherapy has recently been used to process physical, cognitive, and emotional experiences in adolescent populations. Sensorimotor psychotherapy has been found most useful with group formats, which addresses the social developmental context of adolescence and allows for opportunities to face interpersonal challenges and revisit attachment patterns (Mark-Goldstein & Ogden, 2013). Despite promising outcomes and anecdotal data, there is no empirical evidence to date supporting the use of sensorimotor psychotherapy with adolescents who have experienced any form of trauma. Thus, although the concepts explored in sensorimotor psychotherapy are intuitive when working with traumatized clients, it is difficult to operationally define the components of sensorimotor psychotherapy that could hold therapeutic value when working with this population.

Despite the increased recognition of the body's role in the manifestation of trauma related symptoms, there is a marked overall lack of empirical support for body-focused therapy models and interventions geared towards integrating physical movements and sensations into trauma processing. This represents a significant gap in the literature on body-focused interventions, especially given the high prevalence of chronic victimization among adolescents in the U.S. The following section introduces alternative and complementary medicine, with a primary focus on hatha yoga.

Complementary and Alternative Medicine (CAM)

CAM is defined as various health care approaches and products developed outside of conventional and mainstream Western medicine to treat specific conditions or improve overall wellbeing (National Center for Complementary and Alternative Medicine [NCCAM], 2014). Complementary medicine, which is used in conjunction with traditional Western medicine, is the

most common unconventional treatment in the U.S. Conversely, alternative medicine is treatment utilized in place of Western medicine. Examples of CAM interventions include the use of supplements, dietary practices, botanical remedies, spiritual and meditative practices, movement therapies, acupuncture, tai chi, and relaxation techniques such as guided imagery, progressive muscle relaxation, and yoga (Bazzan, Zabrecky, Monti, & Newberg, 2014; NCCAM, 2014). A nationwide survey found that CAM has been used by 38% of adults and 12% of youth in the U.S. to treat a diverse array of medical conditions, including chronic pain, high cholesterol, insomnia, and anxiety (Barnes, Bloom, & Nahin, 2008). The use of CAM is also common for the management of mental illnesses such as mood and anxiety disorders and PTSD (e.g., Barnes et al., 2008; Libby, Pilver, & Desai, 2013).

The forms of CAM used to treat PTSD are mind-body treatments such as relaxation, meditation, exercise therapy, and yoga (Libby et al., 2013). Yoga in particular has become one of the top 10 most widely practiced forms of complementary health care in the U.S. (Duros & Crowley, 2014; NCCAM, 2014). Yoga has been increasingly studied as an adjunctive treatment modality for individuals with various medical and mental conditions including asthma, hypertension, diabetes (e.g., Khalsa, 2004; Manocha, Marks, Kenchington, Peters, & Salome, 2002), chronic pain (e.g., Saper et al., 2009; Sherman, Cherkin, Erro, Miglioretti, & Deyo, 2005), depression, anxiety (e.g., Kirkwood, Rampes, Richardson, Pilkington, & Ramaratnam, 2005; Pilkington et al., 2005), and acute stress reactions (e.g., Telles et al., 2010).

The study of yoga as an adjunctive treatment for chronic stress reactions such as PTSD or complex trauma reactions has also been rapidly unfolding throughout the decades. It is believed that yoga interventions offer a platform for body-based interventions that emphasize integration of the mind and body when treating trauma-related disorders. It does so by utilizing somatically

based bottom-up processing to build internal strengths and resources in a manner that cannot be accessed through talk therapy alone (Duros & Crowley; 2014; Emerson & Hopper, 2011). The following section describes the fundamental origins of hatha yoga, a bodily based practice.

Hatha Yoga

Yoga is a system dating back over 5,000 years, and has been increasing in popularity as a means to alleviate PTSD and related symptoms with both adults and children who have faced a variety of traumas (Duros & Crowley, 2014; Emerson & Hopper, 2011; van der Kolk, 2014). The origins of yoga can be traced back to the meditative practices of three world religions: Hinduism, Buddhism, and Jainism (Emerson & Hopper, 2011). However, despite these religious roots, many who have practiced and written about yoga have argued that yoga itself was not developed to adhere to the philosophies of a particular religion. Rather, yoga is a flexible ideology that can be incorporated into different spiritual or secular traditions, as well as be practiced according to personal or communal goals of individuals or groups (Emerson & Hopper, 2011).

Rooted within this adaptable philosophy, yoga is considered a practice of "inquiry into being," or exploring what it means to be alive (Emerson & Hopper, 2011, p. 26). Yoga's inclusive creed has allowed this ancient religious tradition to become adapted to the needs of a wide variety of populations. Such populations include those who seek a new form of exercise, those in pursuit of spiritual awareness, and those wishing to alleviate stress and increase mindfulness in daily life (Emerson & Hopper, 2011). This flexibility has made yoga a much sought after practice for a range of people. In fact, Yoga Journal (2008) published a study showing that the consumption of yoga in the Western world has drastically increased over the last few decades. Americans spent about $5.7 billion a year on yoga classes and products in

2008, representing an 87% increase in consumption since 2004. There are also a wide variety of yogic styles available that focus to varying degrees on postural alignment and synchronization of movement and breath, such as Vinyasa, Bikram, and Iyengar yoga (Emerson & Hopper, 2011).

Given the wide variety of styles, popularity, and adaptable nature of yoga practices and what is known about the etiology of trauma and the role of neurobiology, there have also been efforts to modify yoga practices to be trauma-sensitive. Out of the large assortment of yoga practices, Hatha yoga aligns well with the overarching goals of trauma-focused treatment in alleviating posttraumatic symptoms. The core components of hatha yoga are the use of breathing practices called pranayama, physical postures called asanas, and meditation. This form of yoga is also ideal to utilize in trauma treatment due to the slower pace, use of simple poses, and ease of modification of poses (Marchand, 2000). The following section highlights important modifications to hatha yoga in order for it to remain sensitive to the unique needs and sensitivities of traumatized individuals while maintaining its emphasis on self-regulation via body and breath regulation.

Trauma-Sensitive Hatha Yoga

The defining features of hatha yoga (asanas, pranayama, and meditation) are thought to be the essential components that make this specific style such an effective means of reducing posttraumatic symptomatology (Spinazolla et al., 2011). Hatha yoga offers a modality to facilitate bodily connection and awareness of self, abilities that are often missing or impaired in survivors of trauma (Duros & Crowley, 2014; van der Kolk, 2005). By focusing on noticing and attuning to one's own bodily sensations and controlling the depth and rate of the breath during yoga practice, individuals learn to more effectively regulate emotions, modulate the sympathetic nervous system, and improve heart rate variability (Spinazzola et al., 2011; van der Kolk, 2013).

However, certain features of hatha yoga must be addressed and modified in order to emphasize a sense of safety, structure, and control for those who have been traumatized.

The Trauma Center Yoga Program has been developing a specialized form of Hatha yoga as a complementary treatment for PTSD that is sensitive to the specialized needs of survivors (Emerson et al., 2009). The key elements of trauma-sensitive yoga strive to alleviate trauma-related symptoms that traditional therapies oftentimes lack the ability to address, such as improvement in emotion regulation by focusing on the physical body (Emerson et al., 2009). These elements encompass adapted fundamentals of the yoga practice itself, as well as environmental factors and individual characteristics of the yoga instructor. The overarching goals of such features are to increase feelings of safety and security while minimizing the sense of vulnerability in participants (Emerson et al., 2009).

Elements of the environment in trauma-sensitive yoga. Keeping in line with the overarching goals of increasing safety and security, the environment in which trauma-sensitive yoga classes take place is very important to consider. Some aspects include utilizing a space in which external noise is minimized, where no mirrors are present to distract participants, and with soft lighting to avoid both darkness and the harshness of bright lights. Windows should also be covered to ensure privacy, and care should be taken to avoid outsiders walking freely into the room, such as mailmen or maintenance workers (Emerson et al., 2009). The preparation of the environment in which the practice takes place sets the stage for the implementation of the trauma-sensitive yoga intervention, which calls for specialized modifications to meet the needs of survivors.

Elements of trauma-sensitive yoga practice. The trauma-sensitive yoga elements of practice include utilizing a small group format, building an emphasis on personal choice, the use

of specific non-threatening poses, and repetition of poses and breathing exercises to build mastery (Emerson et al., 2009; Spinazolla et al., 2011). These aspects of practice are also conducive to achieving a meditative state in which attention is directed towards the participant's inner experiences. Thus, it is very important during practice to remain mindful of and avoid using potentially triggering poses, at least initially. For example, the hip opening pose ananda balasana, commonly known as "happy baby," places individuals in a position laying on their backs with knees bent slightly wider than the torso and pulling downwards on the feet with one's hands (Yoga Journal, 2008). This pose could possibly render individuals feeling uncomfortable, vulnerable, and threatened, especially if they are new to practicing yoga (Emerson et al., 2009). Thus, since hip openers can be very important postures to relieve fatigue and facilitate stretching across the spine and groin, trauma-sensitive yoga would introduce this pose in a careful and progressive manner (Emerson et al., 2009; Yoga Journal, 2008).

This emphasis on gradual exposure to more challenging poses is done very thoughtfully in a trauma-sensitive yoga class. Since survivors of complex trauma often face chronic uncertainty, the emphasis in all classes is to establish a sense of safety by offering several options for each posture and allowing individuals to choose what feels most comfortable for them (Emerson et al., 2009). For example, yoga classes typically end with a resting pose called savasana (Emerson et al., 2009). Within this pose, individuals typically lay on their backs with eyes closed. Due to increased hypervigilance of many individuals who have experienced trauma, this pose may be intolerable and some may choose lay in their backs with eyes open, remain seated, or lay on their side. Thus, the intention for every class is to provide a framework to guide the class structure while allowing individuals to have control and choose the poses that feel most restful or comfortable for them (Emerson & Hopper, 2011). The implementation of trauma-

sensitive yoga practice requires an instructor who possesses an array of skills to effectively manage these classes.

Characteristics of trauma-sensitive yoga instructors. The instructors who individuals listen to and follow throughout a trauma-sensitive yoga class must possess certain qualities that are conducive to their role. Instructors should be positive, fully present, flexible, competent, and well trained in both yogic practices and trauma-informed work (Emerson et al., 2009). However, care should be taken that the instructor does not try to impose his or her own assumptions or beliefs about the experience of the participant. For example, it can become problematic if the instructor uses phrases such as, "This posture is difficult for trauma survivors," in an effort to control the experience of the student (Emerson et al., 2009).

Other basic physical recommendations that trauma-sensitive yoga instructors should be mindful of are to dress conservatively to reduce distractions, avoid excessive movement, and make their location known in the room to facilitate predictability (Emerson et al., 2009). Instructors should also be delivering their words via a steady flowing and calming voice that is gentle yet clear (Emerson & Hopper, 2011). Tone of voice, inflection, and choice of words are critical elements that can help to facilitate feelings of comfort and relaxation.

In accordance with trauma-sensitive treatment, the language used in sessions should encourage participants to move away from self-judgment towards a gentle curiosity about their own internal experiences (Emerson & Hopper, 2011). Language should be non-threatening and invitational, striking a careful balance between being instructive yet flexible (Spinazolla et al., 2011). Emerson and Hopper (2011) refer to this semantic style as using a language of inquiry, where participants are gently encouraged to bring attention to bodily sensations via phrases such as "experiment," "notice," and "approach with interest." This use of phrasing allows for

participants to approach yoga with a mindful spirit focusing on the present moment (Emerson & Hopper, 2011).

In conjunction with language of inquiry, invitatory language is used in trauma-sensitive yoga to offer encouragement to explore one's body. This use of invitatory versus directive language is one major area that trauma-sensitive yoga has modified traditional hatha yoga to fit the needs of participants. Typical yoga classes encourage participants to test their limits in a motivating way, such as by saying, "hold just a little longer" or "push even further" (Emerson et al., 2009). This language may be appropriate to some, but could also trigger trauma-related reactions and discomfort in a trauma survivor. In trauma-sensitive yoga, invitatory language is used to invite the participants rather than push or require them to do as instructors say. Examples of invitatory phrases include "if you like," and "when you are ready" (Emerson et al., 2009).

Taken together, the various elements of a trauma-sensitive yoga class strive to foster a safe environment in which individuals feel comfortable in slowly reconnecting with and attuning to their internal worlds. This physical and visceral self-exploration helps survivors develop a more positive relationship with their own bodies through self-control and regulation of movements and breath (Emerson et al., 2009; Spinazolla et al., 2011). Over time, there has been increasing support for the idea that traumatic experiences impact the mind and body. Trauma-sensitive yoga provides a mechanism for physical healing that traditional trauma-focused talk therapy may neglect to address. The following section describes empirical studies that support the use of trauma-sensitive yoga with individuals who have experienced complex trauma.

Evidence for Trauma-Sensitive Hatha Yoga

Due to the increase in neuropsychological research in examining the effects of chronic traumatization on brain development and functioning, more is known today about the

physiological effects of trauma on the brain and body. This growing awareness of physical manifestations of trauma within the body has spurred research on the use of trauma-sensitive yoga and other physically oriented interventions to improve functioning and reduce symptoms in trauma survivors. While there is ongoing research being conducted in this area, (e.g., Clark et al., 2014; Rhodes, 2015; West et al., 2016), what follows below is a description of what is currently known about trauma-sensitive yoga.

One area of study is in the use of Trauma Center Trauma-Sensitive Yoga (TC-TSY), an empirically supported 10-week group psychosocial intervention for adults impacted by trauma (van der Kolk et al., 2014). TC-TSY has been recognized by the Substance Abuse and Mental Health Services Administration (SAMHSA) as a promising psychosocial intervention for the treatment of trauma and stress-related disorders and symptoms, as well as for improving coping. Van der Kolk et al. (2014) conducted a randomized controlled trial examining the effects of TC-TSY as an adjunctive treatment for 64 adult women experiencing chronic treatment-resistant PTSD. All participants experienced chronic abuse during childhood, and their conditions were considered treatment-resistant due to receiving at least 3 years of prior therapy to treat PTSD. Participants were randomly assigned to either a 10-week trauma-informed yoga intervention or a women's health education class. Each condition consisted of a group format that met on a weekly basis for hour-long classes. The yoga intervention utilized the protocolized trauma-informed yoga program developed by Emerson and Hopper (2011), which utilizes simple and non-interpretive language while incorporating key elements of breathing, postures, and meditation in hatha yoga.

The results indicated that women who participated in the yoga intervention demonstrated a significant reduction in PTSD symptomology both at mid- and post-treatment, with effect sizes

comparable to known therapeutic and pharmacologic approaches (van der Kolk et al., 2014). While participants in the control group also demonstrated a decrease in PTSD symptoms mid-treatment, they reverted back to baseline symptomology post-treatment. Thus, although the supportive nature of the control group may have improved the overall mood of the group, it did not produce a sustained reduction in PTSD symptomology. This suggests that the focus on self-regulation and physical aspects of yoga were key elements responsible for reducing PTSD symptoms, rather than simply the element of positive social interaction (van der Kolk, 2014).

Another study utilized the same participants from van der Kolk's (2014) study to gather additional qualitative data on the use of trauma-sensitive yoga as an adjunctive treatment. West, Liang, and Spinazzola (2016) reviewed the experiences of 31 adult women who were survivors of chronic childhood trauma. The participants engaged in a 10-week TC-TSY intervention and were interviewed afterwards about perceived changes in symptoms and personal characteristics. The authors found that TC-TSY was a potential vehicle for not only symptom reduction, but for personal growth as well. Themes found during interviews were those of an increased sense of empowerment and stronger sense of connectedness with others. There is continuing research further supporting the evidence base for the efficacy of trauma sensitive yoga in reducing PTSD symptoms in adults. For example, trauma-sensitive yoga delivered as an intensive 20-week intervention including home practice was also found to be effective in reducing PTSD symptoms (Price et al., 2016). In addition, ongoing and frequent yoga practice has been found to be associated with long-term improvements in PTSD symptoms (Rhodes, Spinazolla, & van der Kolk, 2016).

Although there are a rapidly growing number of studies demonstrating the effectiveness of yoga on reducing a variety of symptoms in adults receiving trauma-focused therapy, there are

fewer that have established its effectiveness as an adjunct treatment in youth. Spinazzola et al. (2011) adapted trauma-sensitive hatha yoga to use with adolescents aged 12-21 years old in residential treatment. Many of these adolescents demonstrated a wide range of presenting concerns and co-morbid diagnoses. However, the majority had experienced an array of chronic traumatic experiences, such as abuse, neglect, and exposure to violence (Spinazzola, Rhodes, Emerson, Earle, & Monroe, 2011). Results were in the form of individual anecdotal data and clinical observations, which collectively suggested that yoga was a promising viable approach to improve emotion regulation capacities in traumatized youth (Spinazzola et al., 2011). The results also included student reports of increases in bodily awareness, staff noting a marked decrease in the number of behavioral incidents, and new themes being discussed in individual therapy sessions, such as "feeling strong on the inside" (Spinazzola et al., 2011).

While this study highlighted individual benefits for students engaging in yoga sessions and observed improvements in many areas of functioning by instructors and clinical staff, the authors did not empirically test the efficacy of yoga on specific PTSD symptoms of these youth. They also did not collect measures directly from participants to measure outcomes and reduction of symptoms, which undermined the validity of their conclusions that yoga-based intervention can effectively build the self-regulatory capacity of traumatized youth. However, their results did support a growing amount of research indicating that the use of trauma-sensitive yoga has a wealth of potential therapeutic benefits.

Another study was able to utilize pre- and post measures to determine whether changes in PTSD symptomology occurred in youth after a trauma-sensitive yoga intervention. Lee-Kin and Regan (2012) examined the effects of a yoga intervention given in two sessions per week for five weeks on trauma symptoms in 11 juvenile sex offenders. They chose this population due to the

high prevalence of childhood sexual abuse and neglect. Various measures were administered both before and after the yoga intervention to examine prevalence of trauma symptoms and their impact on daily functioning. Significant decreases were found in trauma symptoms after the yoga intervention; however, significant decreases were not found in daily functioning scores (Lee-Kin & Regan, 2012).

This finding is somewhat contrary to the results of other studies using yoga with populations who have experienced trauma. Other studies have found that participants showed improvements in emotional and physical health, decreases in trauma-related symptoms, and a greater capacity to regulate emotions (Lilly & Hedlund, 2010; Spinazzola et al., 2011). The discrepancy in Lee-kin's (2013) study may have been due to the small sample size or by the limited number of sessions. In addition, the juvenile sexual offenders may also have had a distinct trauma history and/or different presenting issues than those who are not sexual offenders. This may suggest a need for an even more specialized intervention to meet the complex needs of this unique population.

There is also some evidence suggesting that yoga has benefits for school aged children. For example, a pilot study by Berger, Silver, and Stein (2009) compared the impact of a 12-week afterschool yoga group with a non-yoga afterschool program with inner city children ages 8 and up. They found that youth who participated in the yoga group had fewer negative behaviors in response to stress and enhanced physical wellbeing than youth in the non-yoga group after the intervention (Berger et al., 2009).

Chapter Summary

Recent advances in research have begun to uncover the physiological manifestations of trauma-related symptoms, an area that has historically been neglected in most evidenced-based

treatment approaches. While many treatments have gained substantial empirical support (e.g., TF-CBT, TARGET), these approaches rely heavily on verbal processing of trauma-related material while focusing very little on the interconnectedness between the mind and body. In line with recent neuropsychological research advances (e.g., Green 2012; Kliethermes et al., 2014; Perry, 2001; van der Kolk, 2005), treatment methodologies have shifted the primary focus of intervention from cognitive oriented and verbally dependent approaches to more body-based modalities, including CAM methods.

The most popular form of complementary health care in the U.S. is yoga, which has gained increasing empirical support as an adjunctive treatment for a variety of medical and mental health conditions such as hypertension, chronic pain, and anxiety (Duros & Crowley, 2014; NCCAM, 2014). The use of yoga, specifically hatha yoga, has also been extended to survivors of chronic trauma due to its focus on building awareness of the body and breath through asanas, pranayamas, and meditation (Spinazolla et al., 2011). Its fundamentally flexible nature allows for hatha yoga to be modified to meet the special needs of those who have been traumatized. Trauma-sensitive hatha yoga was developed to emphasize control and safety for participants while maintaining the essential elements of yoga practice (Emerson & Hopper, 2011). The use of trauma-sensitive yoga, specifically TC-TSY, as an adjunctive intervention for adults is currently considered an empirically supported promising practice for the treatment of PTSD. However, the literature on the impact of trauma-sensitive yoga on traumatized youth is limited. Given the developmental impacts of trauma on youth, especially in female populations who are most susceptible to exposure, there is an urgent need for more research on treatment options for this vulnerable population. The following chapter outlines the rationale for the proposed study in further detail.

CHAPTER III

CURRENT STUDY

Given that empirical support for trauma-sensitive yoga interventions with children and adolescents is especially sparse and that developmental changes occur rapidly within this population, future research should target this particular group to maximize positive outcomes and minimize long-term detrimental effects. In addition, since females are at higher risk than males to experience neglect and domestic violence during childhood (NCTSN, 2014), further research especially with female youth is warranted. To date, there is only one published randomized controlled trial study demonstrating the efficacy of trauma-sensitive yoga in decreasing PTSD symptomology in a sample of adult female survivors of childhood trauma (van der Kolk et al., 2014). Another published study has offered qualitative data in support of the use of trauma-sensitive yoga for youth in residential treatment facilities (Spinazzola et al., 2011).

However, there remains a need to conduct more formal and controlled research on trauma-sensitive yoga with traumatized youth to examine its impact on a range of clinical and behavioral outcomes relevant to this population, such as reduction in PTSD symptoms and improved emotion regulation and impulse control. Given that trauma-sensitive yoga has only been examined in the environmental context of residential treatment facilities for youth, it would be important to examine its effectiveness in community-based clinical settings where youth are often first seen. If trauma-sensitive yoga is shown to be effective in reducing the severity and frequency of trauma-related symptoms, then perhaps providing access to this intervention in the community may serve to curb the need to remove youth from their environment into inpatient or residential programs, which in itself often represents a form of trauma (Spinazzola et al., 2011). Therefore, this dissertation examines the efficacy of a trauma-sensitive yoga intervention as an

adjunctive treatment for female youth who have experienced trauma and are undergoing trauma-focused outpatient treatment.

The Family Advocacy Center (FAC) at Baystate Medical Center in Springfield, MA is a nationally accredited Child Advocacy Center (CAC) that serves youth and families affected by trauma within the western MA region. Services offered at the FAC include trauma-focused individual and family therapy, victim support services, on-site forensic interviewing, medical services, and other outreach and advocacy programs. Although the FAC provides an array of clinical services utilizing various therapeutic approaches, only participants who are receiving treatment via TF-CBT or ARC models were eligible to participate in the current study. These modalities focus primarily on verbal processing of traumatic events. Individuals who received treatment via Eye-Movement Desensitization and Processing (EMDR) therapy were not eligible to participate in the study due to the unique sensory aspects of this treatment not found in TF-CBT and ARC.

By incorporating mind-body approaches into traditional trauma treatment, participants may experience greater benefits through improved physiological and emotional regulation and cognitive functioning. It is hoped that this study will contribute to the body of evidence in mind-body practices as adjunctive treatments for traumatized youth. As these interventions continue to garner empirical support and increased popularity, they may soon provide another promising modality of treatment that clinicians can utilize in future trauma treatments. There are several hypotheses grounded in the current literature that are outlined in detail below.

Hypotheses, Exploratory Questions, and Supporting Evidence

The following section outlines the hypotheses that the current study examines related to the effects of trauma-sensitive yoga on psychological wellbeing and self-concept of female youth

with a history of trauma exposure. Supporting evidence is delineated for each hypothesis. In addition, exploratory questions regarding the relationship between pre-existing attitudes towards yoga, history of yoga utilization, and treatment outcomes is outlined.

Hypotheses Related to Complex Trauma and Posttraumatic Symptoms

There is a multitude of research supporting the notion that repeated exposure to interpersonal trauma is related to difficulties with emotion regulation (e.g., Cook et al., 2003; D'Andrea et al., 2010). Complex trauma exposure is also related to issues with self-concept and self-esteem (e.g., Frewen et al., 2011; van der Kolk, 2005), as well as physical symptoms such as dissociation, somatic complaints, and/or difficulties in recovering from heightened physiological states (e.g., Dale et al., 2009; Duros & Crowley, 2014). Therefore, it is hypothesized that:

1. Participants who endorse trauma exposure during their lifetime [as measured by the UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 (Pynoos & Steinberg, 2013) and the UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 Caregiver Version (Pynoos & Steinberg, 2013)] will report difficulties in psychological wellbeing, including:
    - Poor emotional regulation [as measured by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) and the Cognitive Emotion Regulation Questionnaire-Child Version (CERQ-K; Garnefski, Kraaij, & Spinhoven, 2001)]
    - Low self-concept [as measured by the Tennessee Self-Concept Scale 2nd Ed.-Adult Form (TSCS: 2; Fitts & Warren, 1996)]
    - Poor emotional wellbeing, including increased symptoms of depression and anxiety, and stress/physiological dysregulation [as measured by the Depression

Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) and Depression Anxiety and Stress Scale-21 (DASS 21; Lovibond & Lovibond, 1995)]

- Social and behavioral difficulties [as measured by the Youth Outcome Questionnaire Self-Report 2.0 (YOQ SR 2.0; Wells et al., 1996), and Youth Outcome Questionnaire 2.01-Therapeutic Alliance (YOQ-2.01-TA; Wells et al., 1996)]
- Negative views of others and the world [as measured by the World Assumptions Questionnaire (WAQ; Kaler, 2009)]

Hypotheses Testing the Relationship Between Trauma and Yoga Practice

Prior research, although limited, has demonstrated that the implementation of trauma-sensitive yoga interventions has had positive impacts on overall psychological wellbeing, including increased capacity to regulate emotions and decreases in symptomology related to PTSD, depression, anxiety, and interpersonal and behavioral difficulties (e.g., Lilly & Hedlund, 2010; Spinazolla, 2011; van der Kolk et al., 2014). Therefore, it is hypothesized that:

2. After completion of the trauma-sensitive yoga intervention, participants will report significant improvement in PTSD symptomology [as measured by the UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 (Pynoos & Steinberg, 2013) and the UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 Caregiver Version (Pynoos & Steinberg, 2013)], overall psychological wellbeing [as measured by the TSCS:2 (Fitts & Warren, 1996), DERS (Gratz & Roemer, 2004), CERQ-K (Garnefski et al., 2001), DASS and DASS 21 (Lovibond & Lovibond, 1995), YOQ SR 2.0 and YOQ 2.01-TA (Wells et al., 1996), and WAQ (Kaler, 2009)].

Exploratory Questions

Given the increasing popularity of yoga throughout the U.S., it is possible that individuals who have not directly engaged in yoga have pre-conceived views or attitudes about yoga. However, there is currently no known evidence in the literature assessing the effect of pre-existing attitudes and beliefs about yoga on yoga outcome studies. In addition, there is also no known evidence examining differences between traumatized individuals with prior yoga practice experience and those without exposure to yoga. These could be potential mediating factors to consider when implementing non-traditional adjunctive trauma interventions such as yoga.

As stated above, there are no published studies examining the influence of prior beliefs about yoga on the outcome of yoga interventions. These factors may have potential implications in terms of determining if specific characteristics of traumatized individuals will influence the likelihood that they will benefit from trauma-sensitive yoga. Therefore, in order to add this dimension into the literature, the current study examines whether preconceived notions or beliefs about yoga practice will influence the level of participation in the intervention (e.g., drop out rates) as well as intervention outcomes (e.g., degree of change in PTSD and psychological wellbeing). These views may include beliefs about expected benefits and discomfort in participating [as measured by the Beliefs About Yoga Scale (BAYS; Sohl et al., 2011)]. It is hypothesized that:

3. Following the yoga intervention, participants with low expectations of benefits and high expectations of discomfort will be less likely to report positive benefits [as measured by the YES (Galen et al., 2005), TSCS: 2 (Fitts & Warren, 1996), DERS (Gratz & Roemer, 2004), CERQ-K (Garnefski et al., 2001), DASS and DASS 21 (Lovibond & Lovibond, 1995), YOQ SR 2.0 and YOQ-2.01-TA (Wells et al., 1996), and WAQ (Kaler, 2009)].

In addition, there is no known research examining the potential mediating factor of previous yoga practice on trauma-sensitive yoga outcomes. Therefore, the current study examines whether prior yoga experience [as measured by the YES (Galen et al., 2005)] will influence intervention outcomes in the study population. It is hypothesized that:

4. Following the yoga intervention, participants with prior yoga experience will be more likely to report more positive benefits [as measured by the YES (Galen et al., 2005), TSCS: 2 (Fitts & Warren, 1996), DERS (Gratz & Roemer, 2004), CERQ-K (Garnefski et al., 2001), DASS (Lovibond & Lovibond, 1995), DASS 21 (Lovibond & Lovibond, 1995),YOQ SR 2.0 (Wells et al., 1996), YOQ-2.01-TA (Wells et al., 1996), and WAQ (Kaler, 2009)].

CHAPTER IV

METHOD

The following chapter is divided into several subsections describing the implementation of the current study. First, characteristics of the study participants are outlined below. This is followed by a description of the procedure, which includes specific protocols to ensure safety of the participants. The measures used in the study are then described. Lastly, the final subsection outlines the data analyses utilized to test the study hypotheses.

Participants

This study recruited a total of 17 participants who were receiving therapeutic services via TF-CBT or ARC at the FAC in Springfield, MA. Initially the focus of the study was on adolescent females ages 13-19. However, given that prior literature has also indicated that benefits of trauma-sensitive yoga may extend to other populations, the age criteria was extended to include younger females ages 8-12. Given that females are at greater risk for trauma exposure, participants in the current study were female youth between the ages of 8 and 19 years old. In order to ensure that participants were able to understand consent/assent procedures and directives given during the yoga intervention, participants were English speaking. Since not all measures are validated in Spanish or other languages, participants also needed to be able to read and understand English. Furthermore, to decrease risk for study attrition, participants were also required to have been in treatment at the FAC for a minimum of three months at the time of recruitment.

In regards to exclusion criteria, youth in the custody of state protective services (Department of Children and Families) at the time of study participation were unable to participate because they often require different and higher levels of care. In addition,

participants were required to possess adequate cognitive abilities to fully understand the consent/assent process, measures, and yoga instruction. Thus, any individuals with Autism Spectrum Disorder or with a Full Scale IQ under 70 were not able to participate in the study. To ensure all participants met the above-mentioned inclusion and exclusion criteria, a screening instrument was developed for this study was used (see Appendix C).

There were a total of four adolescents and 13 children (n = 17) who were recruited into the study. However, two of the four adolescents left the study prior to beginning the yoga intervention due to unforeseen scheduling conflicts and psychological factors. In addition, one of the 13 children left the study due to moving out of state during the course of the intervention. Given differences in the measures for the adolescents and children, a decision was made to focus only on the data collected for the children. Thus, the final sample consisted of 12 female children (n = 12) ranging from 8-13 years old (M = 10, SD = 1.54). All 12 participants were receiving TC-CBT treatment at the time of the study. In addition, there were two participants who missed one of the six trauma sensitive yoga interventions. The remainder of participants attended all yoga sessions.

Procedure

Clinical staff at Baystate's FAC referred participants to the study after determining via the screening instrument that they met all of the inclusion and exclusion criteria. Consent from parents and/or guardians, as well as assent by youth who were under the age of 18, was obtained. The consent and assent forms clearly delineated the purpose of the study, participation requirements, how confidentiality would be maintained, as well as the voluntary nature of participating. In addition, the forms clearly stated that for the purposes of continuity of the intervention, participants who miss two yoga classes in a row would be withdrawn from the

study. They contained information about the certified yoga instructor, who was trained in trauma-informed yoga. Furthermore, the consent and assent forms outlined anticipated risks that could have resulted for participating in the study, including the potential for being asked very personal questions that may bring about distress and engaging in physical movements that pose minimal risk of injury. The forms described the nature of the trauma sensitive yoga intervention, which utilizes gentle poses that are not strenuous in nature as well as principles that have already been used in existing trauma sensitive yoga classes (Emerson et al., 2009). The participants were advised about safety protocols, the option to withdraw from the study at any time, and incentives for participating. If participants attended all or most of the yoga classes offered, they received the yoga mat and props used for classes at the conclusion of the final class.

Upon obtaining written consent and assent, participants scheduled an appointment with the principal investigator and/or study staff to complete a set of initial questionnaires in the following order: Demographic Questionnaire, YES Pre-Revised (Galen et al., 2005), BAYS (Sohl et al., 2011), TSCS: 2 (Fitts & Warren, 1996), DERS (Gratz & Roemer, 2004) or CERQ-K (Garnefski et al., 2001), DASS or DASS-21 (Lovibond & Lovibond, 1995), YOQ SR 2.0 or YOQ-2.01-TA (Wells et al., 1996), WAQ (Kaler, 2009), and the UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 or UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 Caregiver Version (Pynoos & Steinberg, 2013). The order of administration was selected so that measures with the least sensitive information was completed first to minimize any potential anxiety. In addition, the UCLA PTSD Reaction Index (Pynoos & Steinberg, 2013), which measures exposure to trauma history, was administered last so that memories of negative experiences would not influence responses regarding current psychological wellbeing.

In addition to receiving treatment as usual at Baystate FAC, participants attended the trauma sensitive yoga classes taught by a certified yoga instructor once per week for a total of six weeks. Baystate FAC staff was available if participants experienced distressing physical or emotional sensations at any time during the course of the classes.

After the sixth week, participants completed the following post-intervention questionnaires: YES Post-Revised (Galen, et al., 2005), TSCS: 2 (Fitts & Warren, 1996), DERS (Gratz & Roemer, 2004) or CERQ-K (Garnefski et al., 2001), DASS or DASS-21 (Lovibond & Lovibond, 1995), YOQ SR 2.0 or YOQ-2.01-TA (Wells et al., 1996), and the WAQ (Kaler, 2009). In addition, attempts were made to contact participants to complete the above-mentioned questionnaires at a one-month follow up date to assess for duration of changes in PTSD and psychological wellbeing.

Safety of Participants

Given that there were some anticipated minimal physical and/or psychological risks to participants, several steps were taken to ensure participants' safety during and after their involvement in the study. First, participants were informed that if they found any part of the study distressing and/or wanted to withdraw from the study, they should immediately inform the researcher and discontinue participation. Second, participants were receiving ongoing therapeutic support through Baystate FAC. As part of the consenting process, participants (and parent/guardian if participants were under 18 years old) were to sign a release of information form allowing communication among treatment providers, the project coordinator, and the yoga instructor in the case that any concerns arose. In addition, if participants experienced any psychological distress during the course of the study, they had ongoing access and opportunities to meet with their individual clinicians where these issues could be addressed therapeutically.

The yoga instructor is certified in trauma-sensitive yoga and utilized hatha yoga that does not use complex poses and was gentle without placing significant strain on the body. The details of the safety protocol are outlined in the following section.

Safety protocol. The YOQ SR 2.0 and YOQ-2.01-TA (Wells et al., 1996) contain a subscale of critical items asking about symptoms pertaining to psychosis as well as risky thoughts and behaviors. Specifically, question 19 asks how often participants think about suicide or that they would be better off dead. In addition, question 24 asks participants how often they get angry enough to threaten others. These critical items were checked immediately upon completion of the measure. If a participant reported "rarely," "sometimes," "frequently," or "almost always or always" (anything other than never), the researcher followed an immediate safety procedure in which a licensed clinical psychologist or mental health clinician conducted a risk assessment and referred to appropriate serves if needed.

Measures

Table 1 describes the measures used in the current study. It includes variables assessed, a brief description of each measure, and the scales utilized to assess each variable. What follows afterwards is a description of each measure.

Table 1

Description of Study Variables and Measures

Variable	Measure	Description	Utilized Scales
Prior Yoga Experience	Pre-Yoga Experience Scale (YES)	Assesses extent of prior yoga experience	
Benefits of Yoga	Post-Yoga Experience Scale (YES)	Assesses self-reported benefits of yoga practice	

Variable	Measure	Description	Utilized Scales
Trauma Exposure & PTSD Symptoms	UCLA PTSD Reaction Index and UCLA PTSD Reaction Index-Caregiver Version	Assesses trauma exposure & level of distress related to trauma	Trauma History PTSD Symptoms
Emotional Wellbeing	Depression, Anxiety, and Stress Scale (DASS and DASS-21)	Assesses symptoms related to psychological wellbeing	Anxiety Depression Stress
Self-Concept	Tennessee Self-Concept Scale Second Ed. (TSCS: 2)	Assesses global and specific aspects of self-concept	Total Self-Concept
Social & Behavioral Functioning	Youth Outcome Questionnaire (YOQ SR 2.0 and YOQ 2.01-TA)	Assesses troublesome behaviors	Intrapersonal Distress Somatic Complaints Interpersonal Relations Social Problems Behavioral Dysregulation
Emotion Regulation	Difficulties in Emotion Regulation Scale (DERS)	Assesses difficulties with emotion regulation	Non-acceptance Goals Impulse Control Awareness Strategies Clarity
	Cognitive Emotion Regulation Questionnaire-Child Version (CERQ-K)	Assesses cognitive emotion regulation strategies	Self-Blame Acceptance Rumination Positive Refocusing Refocus on Planning Positive Reappraisal Putting Into Perspective Catastrophizing Blaming Others
Worldview	World Assumptions Questionnaire (WAQ)	Assesses reported views of others & the world	Controllability Comprehensibility/Predictability Trustworthiness/Goodness Safety & Vulnerability

Demographic Characteristics

The current study utilized a questionnaire developed specifically for this study (see Appendix D). The questionnaire obtained demographic information including race, ethnicity, age, and grade. The questionnaire also collected information about any ongoing illnesses, medical diagnoses, and medications participants may be taking.

Experience with Yoga

The YES (Galen et al., 2005) is a revised six item self-report measure that examines participants' prior experiences with yoga, including length of time practicing yoga, average times per week of practice, and general feelings during yoga practice (see Appendix E). The last item of this measure has been revised for use in the current study as a pre- and post- measure of potential yoga benefits and mastery of principles of yoga. The last item contains 23 subsections in which participants indicate on a three point Likert scale how well they feel they are currently functioning in different aspects of everyday life. This section includes items such as "sense of safety, ability to relax, and increased flexibility" to assess for a range of physical and psychological domains of functioning. Although there are no established norms for the YES, this measure was created and used in a previous dissertation study that examined the behavioral effects of hatha yoga as an adjunct to mental health treatment for 21 adolescents with a variety of psychiatric disorders (Galen, 2005). The current study uses a revised post-measure to examine the degree to which participants report yoga impacting the same areas of functioning described above in the pre-measure. It also includes quantitative and qualitative questions in which participants provide feedback about their experience with the yoga class itself, the yoga instructor, and written feedback about any effects of the intervention and suggestions for improvement (see Appendix F).

Beliefs about Yoga

The BAYS (Sohl et al., 2011) is an 11-item self-report measure that assesses participants' pre-existing expectations and beliefs about yoga (see Appendix G). The measure utilizes a seven point Likert scale in which participants indicate the extent to which they believe a statement is true (e.g., it would help me focus). The instrument yields three scales: Expected benefits, expected discomfort, and expected social norms. Preliminary research has demonstrated that the BAYS has good internal consistency ($\alpha = 0.76$), and is an adequately reliable and valid measure of beliefs about yoga using this three-factor structure ($\chi 2$ (41, $n = 213$) = 72.06, $p < .001$; Sohl et al., 2011). In addition, criterion-related validity of the BAYS demonstrated that scores are positively associated with prior experiences and future intentions related to yoga practice (Sohl et al., 2011). This measure was chosen for the study because its use allowed for analysis of the potential mediating impact of beliefs about yoga on intervention outcomes.

Exposure to Trauma

The UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 and the UCLA PTSD Reaction Index for Children/Adolescents–Caregiver version (Pynoos & Steinberg, 2013) are instruments that screen for exposure to various types of trauma and assesses for DSM-5 PTSD symptoms (Appendix O). The caregiver version was utilized for the child yoga intervention group in order to obtain objective reports from caregivers on PTSD symptoms of young participants. The measures consist of four sections, the first being the clinician administered trauma history profile. Clinicians utilize child or adolescent self-report and information from appropriate collateral contacts to screen for 18 different types of trauma exposure, and prompts the clinician to assess for age and features of exposure, such as if the trauma involved physical injury, and if the child/adolescent was a victim or witness.

The second section is the self-report or caregiver report of the child or adolescent's trauma history, which can be verbally administered or completed independently by the child/adolescent or caregiver. This section assesses for 14 types of trauma exposure using a yes/no format and allows for the child/adolescent to write a brief description of the trauma that is currently the most bothersome. The third section consists of a symptom scale that assesses for frequency of PTSD symptoms in the past month according to the DSM-5 (APA, 2013) using a five point Likert scale. As in the second section, the clinician has the option to administer this portion verbally or have the child/adolescent or caregiver complete individually. Finally, the fourth section is a frequency rating sheet in which the child/adolescent or caregiver rates the frequency of symptoms in the past month using objective time anchors.

The UCLA PTSD Reaction Index for Children/Adolescents-DSM 5 and its caregiver version (Pynoos & Steinberg, 2013) have been empirically supported for use in identifying youth meeting the updated PTSD criteria in the DSM-5 (Hafstad, Dyb, Jensen, Steinberg, & Pynoos, 2014). These measures were chosen for the study due to their ability to assess for exposure to a wide range of trauma, including multiple types of interpersonal traumatic events such as sexual abuse, physical abuse, neglect, domestic violence, kidnapping, and having an impaired caregiver (Pynoos & Steinberg, 2013). It also is the most updated form of the measure that reflects the recent changes in the DSM-5 to PTSD diagnostic criteria (APA, 2013).

Emotional Wellbeing

The DASS (Appendix K; Lovibond & Lovibond, 1995) is a 42-item self-report measure that assesses negative emotional states of depression, anxiety, and stress. It utilizes a four point severity/frequency scale for participants to rate the extent to which they have experienced each mood state in the past week. The DASS-21 (Appendix L) is a short version of the DASS used

with children in the current study. It contains 21 questions and minimizes burden on young participants to complete given its shorter length. Both the DASS and DASS-21 (Lovibond & Lovibond, 1995) yield three scales: Depression (assesses aspects of depression such as dysphoria, hopelessness, lack of interest), anxiety (assesses physiological symptoms including autonomic arousal), and stress scale (assesses stress-related responses such as ability to relax, level of irritability). Various studies have found that the DASS distinguishes well between features of depression, physiological arousal, and psychological tension, and demonstrates acceptable to excellent internal consistency and concurrent reliability (e.g., Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1995). These measures were selected for their accessibility and ability to distinguish between physiological arousal and other negative mood states. They can also group participants based on level of symptom severity within each scale (ranging from normal to extremely severe).

The TSCS: 2 (Fitts & Warren, 1996) is an 82-item self-report instrument that assesses for various types of self-concept. It utilizes a five point Likert scale to measure the degree to which participants identify with each aspect of self-concept and yields two summary scores of total self-concept and conflict. In addition, there are six self-concept scales: Physical, moral, personal, family, social, and academic/work self-concept, and three supplementary scores (identity, satisfaction, and behavior). Higher scores on each of the scales indicate higher self-concept (see Appendix H). This measure has been standardized on a representative nationwide sample of more than 3,000 individuals from 7-90 years of age and includes 4 validity scores to detect inconsistent responding, self-criticism, faking good, and response distribution (Fitts & Warren, 1996).

This measure was selected for the current study because of its sound psychometric properties and the empirical support for use in both traumatized populations and in a prior study utilizing a yoga intervention. For the purposes of this study, only the Total Self-Concept Score was utilized as a measure of change in overall self-concept. Previous research has demonstrated that low self-concept scores on the TSCS: 2 (Fitts & Warren, 1996) were correlated with trauma exposure and trauma-related symptomology (e.g., Dale et al., 2011; Narisco, 2007). In addition, Dale et al. (2011) found that frequent yoga practice positively impacted overall self-concept for a sample of adult females with a history of childhood trauma exposure.

Social and Behavioral Functioning

The YOQ SR 2.0 (Wells et al., 1996) is a 64-item self-report measure in which participants indicate on a five point Likert scale the frequency in which each troublesome situation, behavior, and mood occurred in the past week. Similarly, the YOQ 2.01-TA (Wells et al., 1996) is a 64-item parent/guardian report measure in which the parents or caregivers of child participants indicate on a five point Likert scale the frequency in which they observed various behaviors over the past week. This caregiver measure can be used with youth ages 4-17.

Both the YOQ SR 2.0 and YOQ 2.01-TA (Wells et al., 1996) yield seven subscales that capture several domains of functioning frequently impacted by trauma exposure: intrapersonal distress, somatic complaints, interpersonal relations, social problems, and behavioral dysregulation (Appendix M). The YOQ 2.01-TA yields an additional subscale comprised of 4 questions measuring development of therapeutic alliance in mental health treatment. These measures were designed for a variety of applications, such as assessing progress in mental health treatment and as an indicator of intervention program effectiveness (Wells et al., 1996). The YOQ SR 2.0 has been standardized on two samples: a clinical (1,300 adolescent self-reports) and

community sample (530 adolescent self-reports) from the Rocky Mountain area of the United States. The YOQ SR 2.0 demonstrates good reliability, validity, and sensitivity (e.g., Dunn et al., 2005; Ridge, Warren, Burlingame, Wells, & Tumblin, 2009; Wells et al., 1996). Similarly, the YOQ 2.01-TA (Wells et al., 1996) has shown good reliability and validity in prior studies (e.g., Durham et al., 2002). The YOQ SR 2.0 and YOQ 2.01-TA (Wells et al., 1996) were chosen for this study for their strong psychometric properties and their intended use as a measure of change over time in behavioral and interpersonal domains.

Emotion Regulation

The DERS (Gratz & Roemer, 2004) is a 36-item self-report measure that assesses for multiple aspects of emotional dysregulation. Participants respond to items by indicating how often they experience various emotional difficulties using a five point Likert scale. This instrument yields a total score and six other subscales: Non-acceptance of emotional responses, difficulties engaging in goal directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity (see Appendix I). The DERS is considered one of the most comprehensive measures of emotion dysregulation in adults, and has demonstrated sound psychometric properties including good reliability and validity in use with adolescents (Weinberg & Klonsky, 2009). This measure was chosen for these reasons as well as for its accessibility and ability to capture multiple elements of emotional dysregulation.

The youth version of the Cognitive Emotion Regulation Questionnaire (CERQ-K; Garnefski et al., 2007) is another measure appropriate for youth ages 9 and up that assesses the degree to which youth use various emotion regulation strategies after experiencing negative events. It is a 36-item self-report measure modified from its adult version to use simpler

phrasing appropriate for youth. It uses a five point Likert scale for participants to rate how frequently they use each strategy. This measure was chosen for its ability to utilize with children and its good internal consistency, factorial validity, and criterion-related validity (Garnefski et al., 2007). It yields nine emotion regulation strategies that children may use after negative events: Self-blame, acceptance, rumination, positive refocusing, planning, positive reappraisal, putting into perspective, catastrophizing, and blame others (Appendix J). Descriptions of each scale are below:

The Self-Blame scale measures the extent to which participants hold themselves responsible for what they've experienced, and the degree of preoccupation with thoughts about the mistakes they've made. The Acceptance scale assesses the extent to which participants resign themselves to what has happened to them and accept it, and the tendency to think that circumstances cannot be changed. Although practicing acceptance is generally a positive process, a very high level of acceptance may also indicate a dysfunctional form of resignation in the sense of not feeling able anymore to influence events, or a negative form of resigning to the situation. The Rumination scale examines the extent to which participants are preoccupied with the feelings and thoughts associated with negative events. Higher scored are associated with emotional difficulties and dysfunction.

The Positive Refocusing scale assesses the degree to which participants redirect their thoughts to positive matters as an emotion regulation strategy. High scores refer to frequent use of this strategy and are positive for individual's wellbeing, while low scores are associated with a low sense of emotional wellbeing. The Refocus Planning scale measures how often participants think about steps to take to deal with a negative event or change the situation as an emotion regulation strategy. While high scores are positive, low scores are associated with greater

emotional dysregulation. The Positive Reappraisal scale assesses the degree to which participants attribute positive meanings to negative events, such as thinking that the event made them stronger, or looking for positive sides of an event. Higher scores are considered a positive use of this emotion regulation strategy, while low scores refer to less frequent use of positive reappraisal.

The Putting into Perspective scale refers to the extent to which participants engage in thoughts that play down the seriousness of negative events when compared to other events. The Catastrophizing scale assesses the extent to which participants have recurring thoughts about how terrible the negative events were, and about how these events were the worst thing to happen to a person. High T-scores suggest frequent catastrophizing and are associated with emotional dysfunction and distress, while low scores refer to less frequent use of this strategy. Lastly, the Other-blame scale measures how often participants hold others responsible for negative events that have occurred and the extent to which they think about mistakes others have made. High scores indicate more frequent use of this emotion regulation strategy, which can indicate dysfunctional externalization of blame.

Worldview

The WAQ (Kaler, 2009) is a 22-item self-report measure that assesses the assumptions of participants about others and the world. It utilizes a six point Likert scale to determine the degree to which participants agree or disagree with each statement. This measure yields four subscales related to different aspects of worldview: Controllability of events, comprehensibility and predictability of people, trustworthiness and goodness of people, and safety and vulnerability (Appendix N). The subscales are described below:

The Controllability of Events subscale assesses participants' beliefs regarding the controllability of life's outcomes, how much control people have over the events that befall them, and how much control people have over others. Lower scores reflect more negative views on controllability of life events. The Comprehensibility and Predictability of People subscale assess beliefs about the predictability of life events. This category includes beliefs that events can occur randomly among the general population, and beliefs around the principle of justice (i.e., good things happen to good people). Lower scores on this subscale indicate that participants more strongly hold the belief that life events occur at random, with little ability to control them. Higher scores suggest that participants do not agree with the belief that life events are generally uncontrollable.

The Trustworthiness and Goodness of People subscale measures beliefs about the nature of people. Specifically, is assesses beliefs about whether one can truly know another person, and general goodness and reliability of others. Lower scores indicate greater endorsement of beliefs that others are generally not trustworthy or inherently good. Lastly, the Safety and Vulnerability subscale assesses participants' beliefs about one's fragility, the possibility that very bad things may occur, and one's vulnerability to negative or dangerous events. Lower scores on this subscale suggest that participants hold the beliefs that one is fragile, and that very bad things can happen anytime to anyone.

The WAQ was the product of a past dissertation study seeking to develop a measure of the assumptive world (Kaler, 2009). On a sample of 236 undergraduate students at a large Midwestern university, the WAS was found to be moderately related to other trauma-related symptoms on the Posttraumatic Stress Disorder Checklist (PCL-S; Weathers, Litz, Herman,

Huska, & Keane, 1993) such as PTSD symptomology, negative affect, and trauma-related cognitions (Kaler, 2009).

The WAQ has very good internal consistency and represents an improvement over existing measures of cognition in the trauma literature because it does not require the participant to reference a trauma in completing the questionnaire, which could potentially prime for awareness of stressful events and influence responses (Kaler, 2009). This measure was chosen for its ability to accurately capture worldviews without directly referring to traumatic events. It was also chosen because of its strong psychometric properties as compared to another well-established measure in the field, the World Assumptions Scale (Janoff-Bulman, 1989).

Data Analyses

Since there were a limited number of available adolescent females receiving trauma-focused treatment at the time of recruitment, the control group was eliminated so that data analysis would focus on the immediate effect of the yoga intervention via within-subjects analyses utilizing data from pre-yoga and post-yoga intervention. Preliminary analyses were conducted to gain a better understanding of the participants with regard to demographic characteristics, history of trauma exposure, experience with yoga, and beliefs about yoga. Descriptive statistics and one-sample t-tests were conducted to understand and compare the participants' baseline levels of PTSD and psychological wellbeing (i.e., emotional wellbeing, overall self-concept, social and behavioral difficulties, strategies of emotion regulation, and worldview) to established norms. Next, within samples t-tests were conducted to compare participants' PTSD symptoms and psychological wellbeing from pre-intervention to post-intervention. Change scores were then calculated in order to determine the degree of change

from pre- to post-intervention. To examine relationships between baseline variables and the degree of change from pre- to post-intervention, Pearson correlations were run.

CHAPTER V

RESULTS

This chapter is divided into smaller subsections. The first section describes the participants, including prevalence of trauma exposure, prior yoga experience, and existing beliefs about yoga practice. The second section describes the overall wellbeing of the participants, including psychological wellbeing, emotion regulation abilities, self-concept, social and behavioral difficulties, and worldview. The third section presents the relationships between demographic variables and psychological wellbeing variables as they relate to the study hypotheses. Lastly, the final section explains the results pertaining to the exploratory question.

Demographic Characteristics

Prior Yoga Experience and Beliefs about Yoga

Out of the total child sample (n = 12), 11 participants (91.7%) had never practiced yoga before. Participants obtained total scores on the BAYS ranging from 39-66, with an average total score of 53.92 (SD = 8.64). Participants' average score was not significantly different than the normative population used in Sohl et al.'s 2011 study, $t(11) = -0.68$, $p = .51$. Despite most participants having never have practiced yoga, the majority of participants (83.3%) reported expecting that yoga would have positive health benefits.

Prevalence and Types of Trauma Exposure

In accordance with the inclusion criteria of the current study, all participants in the current study are female youth who reported having had exposure to some form of trauma during their lifetime. There were 14 different forms of abuse endorsed by participants. The majority of participants (75%) reported experiencing more than one type of trauma. Three participants

(25%) reported experiencing one type of trauma, six participants (50%) experienced 3-5 types of trauma, and three participants (25%) reported experiencing 6-7 different types of trauma.

The most commonly reported form of trauma experience was sexual abuse, with nine participants (75%) endorsing lifetime exposure. Separation from a primary caregiver was the second most common type, with seven participants (58.3%) reporting lifetime exposure. The third most common form of trauma was emotional abuse, with six participants (50%) reporting lifetime exposure. Table 2 describes the nature of trauma experiences reported by participants and the frequencies of different forms of trauma exposure.

Table 2

Frequency of Trauma Exposure Endorsement

Type of Trauma	Number (Percent)
Sexual Abuse	9 (75%)
Separation from Caregiver	7 (58.3%)
Emotional Abuse	6 (50%)
School Violence	5 (41.7%)
Bereavement	5 (41.7%)
Disaster	5 (41.7%)
Impaired Caregiver	3 (25%)
Neglect	3 (25%)
Medical Illness	1 (8.3%)
Accident	1 (8.3%)
Domestic Violence	1 (8.3%)
Physical Abuse	1 (8.3%)
Sexual Assault/Rape	1 (8.3%)
Community Violence	1 (8.3%)

PTSD and Psychological Wellbeing at Baseline

PTSD Symptoms

Participants varied in terms of their total PTSD symptoms, with scores ranging from 11 to 49. Table 3 describes the participant's PTSD symptomology and the minimum scores required to meet criteria for a PTSD diagnosis for each diagnostic category. As evident in Table 3, two participants (16.7%) received scores below the diagnostic criteria for PTSD and not all participants met the criteria for the other symptom subscales. All participants endorsed intrusion symptoms meeting diagnostic criteria and that their symptoms impaired functioning for at least one month.

Table 3

Posttraumatic Symptoms of the Participants

Posttraumatic Symptom	Sample *M* (*SD*)	Minimum Score for Diagnosis	Number (%) Met Diagnostic Criteria
Posttraumatic Stress Symptom Total	32.58 (11.47)	15.00	10 (83.3%)
Intrusion Symptoms	8.08 (3.58)	2.00	12 (100.0%)
Avoidance Symptoms	3.92 (2.23)	3.00	9 (75%)
Negative Cognition/Mood Symptoms	11.58 (4.01)	6.00	11 (92.7%)
Arousal Symptoms	8.20 (4.78)	4.00	9 (75.0%)

Note. Norms from Pynoos and Steinberg (2013).

Psychological Wellbeing

Possible scores on the YES range from 0-46, with higher scores indicating greater degree of experiencing positive aspects of everyday functioning and mastery of fundamental yoga principles. Participants' baseline scores ranged from 9 to 34, indicating that they experience a high degree of variability in their mastery of yoga principles and everyday functioning.

As evident in Table 4, the participants also varied in terms of emotional wellbeing. The current sample reported significantly higher depression, anxiety, and stress scores compared to a normative female population. However, the mean self-concept score for participants was in the average range and did not differ from the normative sample with regard to self-concept.

In regards to social and behavioral functioning, participant's total scores were significantly higher than the normative population. The total score is comprised of several subscales, and participant's scores on all subscales of social and behavioral functioning were significantly higher than the normative female sample in Burlingame et al.'s (2005) study. Thus, they experienced greater distress, difficulties with interpersonal relationships, somatic symptoms, and behavioral challenges than the normative population. In addition, participant scores on the Critical Items subscale were also significantly higher than the female normative sample. None of the participants endorsed suicidal ideation.

In regards to emotion regulation, participants in the current study utilized the following three dysfunctional emotion regulation strategies significantly more often than the normative population: High acceptance and resignation of control, catastrophizing, and blaming others. Participants used other dysfunctional emotion regulation strategies of self-blame and rumination about as often as the normative population. Lastly, participants used adaptive emotion regulation strategies of positive refocusing, refocusing on planning, positive reappraisal, and putting into perspective about as often as the normative population.

Participant's worldviews were compared to norms from a non-traumatized population in Schuler's (2013) study. Lower subscale scores denote negative or pessimistic views (i.e., greater degree of endorsement of negative beliefs). The participant's scores on the Controllability of Events subscale were significantly lower than those of the normative population. This suggests

greater endorsement of beliefs that events are generally uncontrollable among participants when compared to norms. Participants did not differ from the normative population on aspects of worldview involving the comprehensibility and predictability of people, trustworthiness and goodness of people, and safety/vulnerability.

Table 4

Psychological Wellbeing of the Participants and Comparison to Norms

Wellbeing Variables	*Current Sample*		*Normative Sample*	*One Sample t*
	Range	*M (SD)*	*M (SD)*	
Emotional Wellbeing				
Depression[a]	0-32	14.33 (9.14)	6.14 (6.92)	3.11*
Anxiety[a]	2-32	15.08 (9.53)	4.80 (5.03)	3.74**
Stress[a]	4-36	19.67 (7.71)	10.29 (8.16)	4.21**
Self-Concept[b]	32-62	46.42 (8.25)	50.50 (9.90)	-1.17
Social/Behavioral Functioning				
Total Score[c]	27-130	73.83 (33.81)	19.80 (1.10)	4.21**
Intrapersonal Distress[c]	11-38	27.00 (9.49)	8.10 (0.42)	6.91**
Somatic[c]	2-18	7.50 (5.40)	3.20 (0.14)	2.76*
Interpersonal Relations[c]	-4-25	8.20 (8.20)	-.80 (0.21)	3.80*
Social Problems[c]	-1-12	4.75 (3.19)	.30 (0.11)	4.83**
Behavioral Dysfunction [c]	5-35	18.83 (8.86)	6.80 (0.29)	4.70**
Critical Items[c]	1-15	7.58 (4.01)	2.90 (0.12)	4.04*
Emotion Regulation				
Self-Blame[d]	34-67	52.17 (10.00)	54.00 (2.87)	-0.64
Acceptance[d]	36-77	57.92 (10.26)	51.00 (3.12)	2.33*
Rumination[d]	33-76	55.50 (12.67)	49.00 (3.58)	1.78
Positive Refocusing[d]	47-79	57.92 (11.41)	52.00 (3.29)	1.80
Refocus Planning[d]	37-78	55.83 (11.33)	51.00 (3.39)	1.48
Positive Reappraisal[d]	31-79	56.50 (14.56)	50.00 (2.92)	1.55
Put Into Perspective[d]	50-71	55.25 (9.08)	53.00 (3.08)	-1.11
Catastrophizing[d]	49-79	64.67 (9.36)	52.00 (2.34)	4.67**
Other-blame[d]	40-75	65.42 (10.16)	53.00 (1.96)	4.24**
Worldview				
Controllability of Events[e]	9-21	16.92 (3.90)	25.82 (4.90)	-7.92 ***
Comprehensibility and Predictability of People[e]	5-27	13.75 (5.72)	15.88 (4.50)	-1.29
Trustworthiness and Goodness of People[e]	15-33	21.58 (4.92)	21.05 (4.81)	0.38
Safety and Vulnerability[e]	8-28	17.17 (5.46)	14.08 (3.85)	1.96

Note. [a]Norms from Sinclair et al. (2010). [b]Norms from Fitts and Warren (2003). [c]Norms from Cochran and Hale (1985). [e]Norms from Gratz and Roemer (2004).
* $p < .05$. ** $p < .01$. *** $p < .001$.

Relationships between Age and PTSD and Psychological Wellbeing

Participant age was not significantly correlated with total PTSD scores or scores measuring levels of intrusion symptoms, negative thoughts, or arousal symptoms. However, there was a significant negative correlation between participant age and their avoidance symptom scores, $r = -.61$, $p = .03$. Younger participants experienced greater avoidance symptoms at baseline than older participants. There was not a significant relationship between participant age and any psychological wellbeing baseline scores.

Impact of Yoga

Changes in PTSD Symptoms

Changes in PTSD symptoms are outlined in Table 5. There were no significant changes in total PTSD symptoms, nor were there significant changes in levels of intrusion, avoidance, negative cognition, or arousal symptomatology from pre- to post-yoga intervention.

Changes in Psychological Wellbeing

Table 5 also describes the differences in mean scores of psychological wellbeing from pre- to post-yoga intervention. In regards to emotional wellbeing, the yoga intervention had a significant positive effect on mean scores of everyday functioning, suggesting that they experienced an increase in positive aspects of daily functioning and improvement in their sense of mastery over yoga principles, including tolerance of stillness, ability to relax, and self-acceptance. Participants also endorsed a significant decrease in the following variables of emotional wellness post-yoga intervention: Depression, anxiety, and stress symptoms. There were no significant changes with regard to the participants' self-concept.

There were also no significant changes in total social and behavioral functioning. When examining the subscales comprising social and behavioral functioning, there were no significant changes in scores of intrapersonal distress, interpersonal relations, somatic symptoms, social problems, or behavioral dysfunction. However, the yoga intervention did have a significant effect on participants' endorsement of critical items. The participants scored significantly lower on the critical items post-yoga intervention.

Participants in the current study did not experience significant changes from pre- to post-yoga intervention in their use of any emotion regulation strategies. However, the yoga intervention did have a significant positive effect on participant worldview scores of controllability of events and safety and vulnerability.

Table 5

Changes in Psychological Wellbeing

Wellbeing Variable	Pre-Yoga *M (SD)*	Post-Yoga *M (SD)*	*F*
PTSD Symptomatology			
PTSD Symptom Total	32.58 (11.47)	29.08(11.6)	1.07
Intrusion Symptoms	8.08 (3.58)	6.58 (4.48)	1.63
Avoidance Symptoms	3.92 (2.23)	3.58 (1.08)	0.25
Negative Cognition and Mood Symptoms	11.58 (4.01)	9.50 (4.17)	2.77
Arousal Symptoms	8.20 (4.78)	7.92 (3.60)	0.04
Emotional Wellbeing			
Everyday Functioning	22.83 (7.20)	30.25 (7.64)	15.69**
Depression	14.33 (9.14)	9.00 (7.99)	5.77*
Anxiety	15.08 (9.53)	7.75 (6.21)	6.25*
Stress	19.67 (7.71)	12.17 (7.00)	6.14*
Total Self-Concept	46.42 (8.25)	48.92 (9.71)	0.44
Social and Behavioral Functioning			
Total Score	73.83 (33.81)	63.42 (30.51)	3.59
Intrapersonal Distress	27.00 (9.49)	22.75 (9.65)	4.38
Somatic	7.50 (5.40)	6.08 (3.80)	2.00
Interpersonal Relations	8.17 (8.18)	7.17 (7.17)	0.68
Social Problems	4.75 (3.19)	4.50 (4.06)	0.09
Behavioral Dysfunction	18.83 (8.86)	17.33 (7.90)	1.39

Table 5 Continued

Wellbeing Variable	Pre-Yoga *M (SD)*	Post-Yoga *M (SD)*	*F*
Critical Items	7.58 (4.01)	5.42 (3.12)	8.19*
Emotion Regulation Strategies			
Self-Blame	52.17 (10.00)	46.42 (15.24)	0.91
Acceptance	57.92 (10.26)	54.17 (7.93)	3.30
Rumination	55.50 (12.67)	55.42 (6.61)	0.00
Positive Refocusing	57.92 (11.41)	59.68 (9.68)	0.49
Refocus on Planning	55.83 (11.33)	58.67 (11.84)	1.32
Positive Reappraisal	56.50 (14.56)	60.83 (9.76)	1.03
Put Into Perspective	55.25 (9.08)	54.25 (10.00)	0.02
Catastrophizing	64.67 (9.36)	58.58 (19.35)	1.05
Other-blame	65.42 (10.16)	55.58 (19.20)	1.92
Worldview			
Controllability of Events	16.92 (3.90)	19.63(3.83)	8.39*
Comprehensibility/Predictability of People	13.75 (5.72)	15.00 (5.73)	0.64
Trustworthiness and Goodness of People	21.58 (4.92)	23.18 (5.49)	0.83
Safety and Vulnerability	17.17 (5.46)	20.00 (5.50)	5.20*

*$p < .05$. **$p < .01$.

Relationship between Baseline Scores and Degree of Change

The following section describes the significant results of Pearson correlations that examined the relationship between participant's baseline scores and the degree of change from pre- to post intervention (Table 6). This section also describes non-significant results that met Cohen's (1988) criteria for a large effect size, which is $r = .50$.

Changes in PTSD Symptoms

There were significant negative relationships between baseline avoidance and arousal PTSD symptoms and the degree of change in these symptoms, thus indicating that participants with greater arousal and avoidance symptoms at baseline experienced greater improvement in these symptoms post-intervention. As evident by the *r* values, there were large effect sizes with regard to two of the other PTSD symptom scores; participants with higher PTSD and negative

thoughts scores tended to show greater improvements post-yoga intervention.

Changes in Psychological Wellbeing

With regard to emotional wellbeing, there were significant negative relationships between baseline anxiety and stress scores, and the degree of change in each of these symptoms. This suggests that participants with more symptoms of anxiety and stress at baseline had greater decreases in these symptoms after yoga. As evident by the *r* values, there was a large effect size with regard to levels of depression. Those with higher depression at baseline tended to show greater improvement post-yoga intervention. In addition, there was a significant negative relationship between baseline self-concept and its degree of change, suggesting that participants with lower self-concept at baseline experienced greater increases in self-concept after yoga.

There were generally no significant relationships between baseline scores of social and behavioral functioning and the degree of change in these scores. However, participants with higher baseline scores of somatic symptoms and critical items endorsed greater improvement in these areas post-intervention. With respect to maladaptive strategies of emotion regulation, participants with greater use of self-blame, acceptance, rumination, and blaming others as emotion regulation strategies at baseline utilized these strategies significantly less frequently after the yoga intervention. When examining adaptive emotion regulation strategies, participants who used positive reappraisal less often at baseline experienced greater improvement in using this strategy after yoga. There were also large effect sizes with regard to two other adaptive emotion regulation strategies, suggesting that those who used less positive refocusing and putting into perspective before yoga tended to show greater use of these strategies after yoga. Lastly, there were not significant relationships or large effects between baseline worldview and the degree of change in worldview after yoga.

Table 6

Correlations between Baseline Scores and Degree of Change

Variables	*r*
PTSD Symptomatology	
PTSD Total Score	-.50 [L]
Intrusion	-.32
Negative Thoughts	-.50 [L]
Avoidance	-.89**
Arousal	-.70*
Emotional Wellbeing	
Everyday Experience	-.38
Depression Total	-.56 [L]
Anxiety Total	-.80**
Stress Total	-.74**
Self-Concept Total	-.67*
Social and Behavioral Functioning	
Total Score	-.45
Intrapersonal Distress	-.35
Somatic	-.71**
Interpersonal Relations	-.48
Social Problems	-.11
Behavioral Dysfunction	-.46
Critical Items	-.63*
Emotion Regulation	
Self-Blame	-.73**
Acceptance	-.64*
Rumination	-.87**
Positive Refocusing	.54 [L]
Refocus on Planning	.37
Positive Reappraisal	.78*
Put Into Perspective	.57 [L]
Catastrophizing	-.35
Other-blame	-.68*
Worldview	
Controllability of Events	.47
Comprehensibility and Predictability of People	.46
Trustworthiness and Goodness of People	.41
Safety and Vulnerability	.42

[L] = large effect size. *$p < .05$. **$p < .01$.

Impact of Age and Beliefs about Yoga on Changes Post-Intervention

Given that there were several significant relationships between baseline scores and the degree of change in PTSD and psychological wellbeing, unstandardized change scores were calculated. Unstandardized change scores eliminate baseline variance that may contribute to differences found in the degree of change in symptoms. The following section reviews the significant correlations between variables of age and beliefs about yoga and unstandardized changes in PTSD and psychological wellbeing.

As evident in Table 7, older participants experienced significantly greater improvement in depression and somatic symptoms after yoga. In addition, there was a large effect with regard to age and one aspect of worldview; older participants reported a greater improvement in views related to the comprehensibility and predictability of people.

When examining the relationships between beliefs about yoga and the degree of change in PTSD and psychological wellbeing, there was a large effect size with respect to changes in anxiety. Participants with more positive beliefs about yoga reported greater improvement in their anxiety symptoms post yoga. Additionally, participants who held more positive beliefs about yoga increased the most in their use of rumination and putting into perspective after yoga. Furthermore, participants with more positive beliefs about yoga experienced a greater decrease in their use of positive refocusing as an emotion regulation strategy.

Table 7

Correlations between Age and Beliefs about Yoga and Change in PTSD and Psychological Wellbeing

Unstandardized Change Scores	Age	Beliefs About Yoga
PTSD Symptomatology		
PTSD Total	.03	.14
Intrusion	-.05	.10

Table 7 Continued

Unstandardized Change Scores	Age	Beliefs About Yoga
Avoidance	.16	.36
Negative Thoughts	-.07	.13
Arousal	-.25	-.21
Emotional Wellbeing		
Everyday Functioning	.06	.23
Depression	.58*	.24
Anxiety	.22	.50 [L]
Stress	.19	.48
Self-Concept	.31	-.11
Social and Behavioral Functioning		
Total Scores	.46	-.06
Intrapersonal Distress	.28	.06
Somatic	.66*	-.17
Interpersonal Relations	.43	-.17
Social Problems	.27	.13
Behavioral Dysfunction	.29	-.06
Critical Items	.19	-.35
Emotion Regulation		
Self-Blame	.02	-.22
Acceptance	-.30	.12
Rumination	.12	.60*
Positive Refocusing	.04	-.62*
Refocus on Planning	.23	-.04
Positive Reappraisal	-.08	-.15
Put Into Perspective	.16	.68*
Catastrophizing	.11	.12
Other-blame	-.04	-.02
Worldview		
Controllability of Events	-.38	-.11
Comprehensibility and Predictability of People	-.54[L]	.03
Trustworthiness and Goodness of People	.10	.38
Safety and Vulnerability	-.34	.28

[L] = large effect size. * $p < .05$.

CHAPTER VI

DISCUSSION

The present study contributes to the dearth of published literature specifically focused on examining the impact of trauma-sensitive yoga on youth who have experienced complex trauma. The following sections will discuss the study hypotheses, implications, limitations, and suggested areas of future research.

Relationship between Hypotheses and Results

The majority of participants met DSM 5 (APA, 2013) diagnostic criteria for PTSD at baseline, with most participants reporting exposure to more than two types of traumatic events. It was hypothesized that participants who endorse trauma exposure will experience PTSD symptomology at baseline and have difficulties with psychological wellbeing, including poor emotion regulation, low self-concept, symptoms of depression and anxiety, stress and physiological dysregulation, social and behavioral difficulties, and negative worldviews. Results indicate that participants in the current study struggled significantly in nearly all of the above noted areas of psychological wellbeing. Specifically, participants reported significantly greater difficulties in total social and behavioral functioning and higher levels of depression, anxiety, and stress than the normative population. In addition, they had higher intrapersonal distress, somatic complaints, social and interpersonal relationships issues, and behavioral dysfunction than norms. Participants endorsed significantly more critical items, such as obsessive-compulsive behavior, eating disturbances, and perceptual disturbances, significantly more than the normative population, suggesting they experienced other serious psychiatric concerns.

In regards to emotion regulation, participants did not significantly differ in their use of the following emotion regulation strategies: Self-blame, rumination, positive refocusing, refocus

on planning, positive reappraisal, and putting into perspective. However, participants in the current study had significantly higher rates of acceptance of their circumstances, tended to experience catastrophizing and distressing cognitions, and generally blamed others for negative events. According to Garnefski et al. (2002), while acceptance is generally considered a positive process for most events, very high levels of acceptance may also signify a negative sort of resignation in the sense of a feeling unable to exert influence or change events. Thus, participants in this study tended to feel a greater sense of powerlessness over their circumstances than the norm.

Lastly, participants' worldview related to their sense of controllability of events was significantly lower than the normative population, suggesting that participants likely felt little sense of control over what happens to them. This is consistent with existing literature suggesting that individuals who experience prolonged or repeated interpersonal trauma often experience difficulties in developing a sense of efficacy in the world due to their prior circumstances of often being under the coercive control of others who hold more power (e.g., Herman, 1992). Participants did not significantly differ in their worldviews related to comprehensibility and predictability of people, trustworthiness and goodness of people, or their sense of safety and vulnerability. Participants' sense of total self-concept was also not significantly different than that of the normative female child population. These findings are not consistent with prior studies indicating that traumatized youth with PTSD developed significant interpersonal difficulties and had significantly lower self-concept than non-traumatized youth (e.g., Saigh et al., 2008; van der Kolk, 1992).

It was also hypothesized that participants would report significant improvement in PTSD symptoms and psychological wellbeing after the yoga intervention. While there were some

significant findings, it was important to consider the small sample size and low degree of power when interpreting these results. When examining changes in PTSD symptomology, while participants demonstrated decreases in symptoms in the expected direction, they did not endorse statistically significant change. Thus, the hypothesis was not supported in this regard. However, the findings do reveal several significant relationships between baseline PTSD scores and the degree of change after the yoga intervention.

Closer examination of results reveals that there was significant variation in participants' baseline reports of PTSD symptoms. There were medium to large effect sizes when examining the degree of improvement in total PTSD scores, intrusion symptoms, and negative thoughts. In addition, participants with more severe PTSD-related arousal and avoidance symptoms at baseline experienced a greater degree of improvement in their symptoms post-yoga intervention. This finding supports prior studies that have found trauma-sensitive yoga to be helpful in lowering levels of arousal due to its focus on regulating and regaining control of one's breathing and movement (e.g., Spinazzola, 2001; van der Kolk, 2006). Avoidance of aversive stimuli is a well-documented strategy often used to minimize arousal in the body (e.g., Roth & Cohen, 1986). Thus, it may be possible that decreased arousal in participants contributed to a decreased need to utilize avoidance strategies in participants. These results may support the notion that yoga can be particularly beneficial to those experiencing severe PTSD symptoms, and warrants further research.

Consistent with prior literature, participants also reported significant improvement in everyday functioning and mastery of yogic principles, such as the ability to tolerate stillness, quiet thoughts, and focus on the present moment. As hypothesized, symptoms of depression, anxiety, and stress also significantly improved after the yoga intervention, with older participants

experiencing greater improvement in depression. Participants with more severe anxiety and stress also reported significantly greater improvement in these areas post-yoga, further supporting the above stated idea that yoga may have particular benefits for those with severe symptoms.

While participants did not report significant changes in other areas of social and behavioral functioning, the reduction of severe psychopathology is noteworthy. There was a significant reduction in serious psychopathology, including delusions, paranoia, and obsessive-compulsive behaviors. This could perhaps reflect a decrease in the future need for more intensive psychosocial interventions such as inpatient hospitalization or pharmacological treatment. This is an important area for future inquiry, as it may have meaningful implications for the treatment of trauma.

Participants also significantly improved with regard to their worldviews around the controllability of events and their sense of safety. This suggests that participants generally felt an increased sense of predictability in their worlds and did not feel as helpless or vulnerable. This finding contributes to the existing literature on the positive relationship between trauma-sensitive yoga and individual's perceptions of their environments and expectations of the future (e.g., Porges, 2004).

However, aspects of worldview related to individuals' relationships with others did not significantly change. This could perhaps be related to the fact that the nature of trauma experienced by all participants was interpersonal in nature, making perceptions related to relationships with others less sensitive to change. Nonetheless, there were medium effect sizes when comparing baseline scores to the degree of change in worldview. This suggests that

participants with more positive worldviews at baseline experienced the greatest degree of improvement after yoga.

Unlike other measured aspects of psychological wellbeing, participants' self-concept did not significantly change from pre- to post-intervention. This is likely related to the notion within the psychological literature that defines self-concept as construct consisting of personality traits that is relatively stable over time (e.g., Fitts & Warren, 1996; Rosenberg, 1979). Thus, self-concept may be less temporally sensitive to change than other aspects of psychological wellbeing. However, findings from the current study indicate that participants with poorer self-concept at baseline experienced significantly greater improvement in self-concept after yoga. This suggests that the short-term intervention of trauma-sensitive yoga may have some impact on overall self-concept despite its relatively stable nature.

Lastly, results indicated that although emotion regulation did not significantly change from pre- to post-intervention, participants who reported greater use of maladaptive cognitive emotion regulation strategies at baseline tended to use these less frequently after yoga. In addition, trauma sensitive yoga had a significant positive impact on participants' use of positive reappraisal as an emotion regulation strategy, with medium to large effect sizes for the remaining adaptive emotion regulation strategies. Overall, participants tended to decrease in their use of maladaptive emotion regulation strategies and increase their use of adaptive strategies. These overall promising trends are consistent with prior research demonstrating the efficacy of yoga in improving emotion regulation and regulation of the autonomic nervous system, areas greatly impacted by the experience of stress and trauma (e.g., Emerson et al., 2009; Streeter et al., 2012).

It was hypothesized that participants with more positive beliefs about yoga would experience greater improvement in overall symptoms after the intervention. However,

participant's pre-existing beliefs about yoga were not significantly related to changes in their PTSD symptoms or variables of psychological wellbeing. While results generally do not support this hypothesis, it may suggest that yoga can be beneficial to individuals despite their pre-existing ideas or beliefs about it.

Study Limitations

There are several limitations to be considered when evaluating the results of the current study. The most notable limitation of this study is the small sample size, which contributed to the lack of statistical power when analyzing the data. The small sample size was due in part to limited availability of potential participants who met all inclusion criteria during recruitment. One contributing factor to the small sample size was participant attrition (i.e., missing yoga sessions and one-month follow up evaluation). There were several external and psychological factors that contributed to attrition, such as family crises and court dates related to the trauma that activated PTSD symptoms and impacted their participation in treatment. In addition, since participants were recruited at various points in their treatment process, several participants completed treatment during the course of the study. This resulted in unforeseen difficulties for study personnel to continue contact with families after termination in order to obtain follow-up data. Often families did not return telephone calls or come in for scheduled appointments after participants had already completed treatment. Future studies may benefit from recruiting participants at similar phases in their treatment and aligning yoga sessions with treatment so participants do not complete treatment prior to completing the study.

The small sample size resulted in the inability to split participants into intervention and control groups to compare outcomes as originally planned. This significantly limits the ability to attribute changes observed from pre- to post- intervention specifically to yoga. Thus, the

improvements reported by the participants may have been a result of the trauma-focused psychotherapy participants were concurrently receiving. However, the majority of participants remained in the study throughout the yoga classes, and all participants provided positive feedback about the classes and yoga instructor. Other studies have also found that individuals who participate in yoga practice have reaped various benefits and reported generally positive experiences through anecdotal and qualitative data (e.g., Dale et al., 2007; Emerson et al., 2009).

Future Research

Although there were significant limitations within the current study, the findings provide strong support for further research in the use of trauma-sensitive yoga as an adjunct treatment for youth impacted by complex trauma. There are several areas of improvement gleaned from this study that can be applied to future research. First, in order to determine whether adding yoga as an adjunct to trauma-focused treatment is advantageous, future research should aim to allow ample recruitment time and be conducted in a setting that makes it possible to obtain enough participants to include a control group.

It would also be important to decrease the administration time (i.e., using less and shorter measures for youth and caregivers) in order to increase compliance and decrease attrition. In addition, the current study utilized a format that offered yoga once per week for six weeks. It would be interesting to determine whether yoga offered on a more frequent basis (e.g., several times per week) and/or for a longer period would result in faster acquisition of skills and greater improvement in PTSD symptoms and psychological wellbeing.

While the study did use a certified yoga instructor trained in trauma-sensitive yoga, there was not a formal or structured curriculum for the yoga sessions. This makes it difficult to ascertain what aspect of the yoga classes accounted for changes in symptoms and functioning.

Thus, it would be helpful for research to focus on the development of formal yet flexible curriculums specifically for the unique challenges brought about by working with children and adolescents. This would also make it possible to examine what specific aspects of trauma-sensitive yoga are most beneficial for specific populations, such as language used, focus on breath work, specific poses, or the opportunity to connect with others in a shared experience.

Lastly, it was imperative and beneficial for the certified yoga instructor to be trained in trauma-sensitive yoga in order to understand the impact of trauma on physical and emotional functioning and the application of yogic principles to this population. However, given that working clinically with children often requires flexible and creative approaches to maintain rapport, it would be valuable to determine the merit of using an instructor who is also a clinician with prior clinical experience working with traumatized youth.

Conclusion

The current study sought to add to the currently limited literature on the impact of trauma-sensitive yoga on children and adolescents who have experienced complex trauma. The findings offer additional evidence in support of the use of yoga as a feasible adjunct to trauma-focused treatment aimed at decreasing PTSD symptoms and improving psychological wellbeing. The findings suggest that future research should focus on identifying specific aspects of trauma-sensitive yoga that are most beneficial and which populations may benefit most from this intervention.

While it is true that the benefits of yoga have yet to be clearly understood, it remains clear that yoga offers a distinctive opportunity to strengthen one's relationship with the self. The current study highlights the likely positive impacts of yoga on psychological wellbeing, particularly with regard to PTSD arousal and avoidance symptoms, everyday functioning, severe

psychopathology, emotional wellbeing, and worldviews related to safety and controllability. It also underlines the importance of identifying individuals who are most likely to benefit from yoga, such as those with severe psychopathology or PTSD symptoms. It is imperative that research continues to focus on complementary and alternative treatments, such as yoga, especially in its application to society's most vulnerable population, its children. As the evidence base for yoga and alternative treatments grows, so do the opportunities for youth and families to heal from their traumatic pasts.

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Appendix A

University of Hartford Human Subjects Approval

See next page.

UNIVERSITY OF HARTFORD

February 24, 2016

Jessica Silva
87 Spring Street
Glastonbury, CT 06033
JFelician@hartford.edu

Dear Ms. Silva

Proposal ID# PRO16010016

After full committee review of your research proposal, *"Yoga as an adjunctive treatment for adolescents who have experienced complex trauma,"* this project has been approved for one year according to the guidelines established by federal regulation 45 CFR 46.111.

Approval of this research will continue until February 24, 2017. If you plan to continue the research after that date, please inform the HSC one month in advance.

Please keep in mind that it is your responsibility to notify and seek approval from this Committee of any modifications to your project, and that it is your responsibility to report to this Committee any adverse events that occur related to this study. Additional information and both adverse event reporting and modification request forms are available online on the HSC web site: http://www.hartford.edu/hsc.

If you have any questions, please contact Dr. Barbara Crane at (860) 768-5371 or hsc@hartford.edu.

The University of Hartford has an Assurance of Compliance on file with the Office of Human Research Protections (Federalwide Assurance - FWA #00003578).

Congratulations and good luck with your study.

Sincerely,

Barbara Crane, PhD
Chair, Human Subjects Committee

Appendix B

Baystate Medical Center IRB Approval

See next page.

Baystate Medical Center

Institutional Review Board

DATE:	January 22, 2016
TO:	Jessica Wozniak, PsyD
FROM:	Baystate Health IRB #1
STUDY TITLE:	[765235-3] Yoga as an Adjunctive Treatment for Adolescents Who Have Experienced Complex Trauma
IRB REFERENCE #:	BH-15-201
SUBMISSION TYPE:	Response/Follow-Up
ACTION:	APPROVED
APPROVAL DATE:	January 11, 2016
EXPIRATION DATE:	January 11, 2017
REVIEW TYPE:	Expedited Review
PROJECT RISK LEVEL:	Minimal Risk

Thank you for your submission of Response/Follow-Up materials for this research study. The Baystate Health IRB #1 has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

PLEASE NOTE: The IRB Reviewer has determined to grant an exception to allow Jessica Feliciano to conduct the consent process, giver her experience and the nature of the material.

PLEASE NOTE: The IRB Reviewer has determined that permission of one parent is sufficient.

The following items were included in this submission:

- Advertisement - Yoga Flyer v2 (UPDATED: 12/22/2015)
- Application Form - Basic Application Part 2 v3 (UPDATED: 12/22/2015)
- Consent Form - Consent_assent Form v4 with track changes (UPDATED: 01/8/2016)
- Consent Form - Consent_assent Form v4 clean copy (UPDATED: 01/8/2016)
- Other - Memo for IRB Package 765235-2 12 22 15 (UPDATED: 12/22/2015)
- Protocol - Baystate Human Subjects Protocol v3 with track changes (UPDATED: 12/22/2015)
- Protocol - Baystate Human Subjects Protocol v3 clean copy (UPDATED: 12/22/2015)

Please remember that informed consent is a process beginning with a description of the study and verification of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and the research participant. Federal regulations require that each participant receive a copy of the signed consent form unless this requirement has been waived by the IRB.

Proposed changes to the research must be submitted to the IRB for review and approval prior to implementation, unless such a change is necessary to avoid immediate harm to subjects.

Any Unanticipated Problems Involving Risks to Subjects or Others, Deviations from the approved research, Non-Compliance, and Complaints must be reported to the IRB in accordance with Baystate HRPP policies and procedures. If this study includes ongoing oversight by a Data Safety Monitoring Board (DSMB) or other such committee, reports generated by the DSMB or oversight committee must be submitted to the IRB.

Continuations must be submitted 60 days prior to the expiration date noted above. The federal regulations provide for no grace period. Failure to obtain approval for continuation of your study prior to the expiration date will require discontinuation of all research activities for this study, including enrollment of new subjects.

Pediatric study 45 CFR 46.404:

It was determined that this is *"Research not involving greater than minimal risk" 45 CFR §46.404*. At least one parent must sign the consent document indicating permission for the child's participation in the research unless the requirement has specifically been waived by the IRB. Assent of the child to participate must be obtained in accordance with the procedures described in the application to the IRB unless the requirement has specifically been waived by the IRB.

If you have any questions regarding this approval, please contact the IRB office at (413) 794-4356.

Appendix C

Referral Screening Instrument for Clinicians

Clinician Name: _____

Client Name: _____

Please check off the appropriate response in order to determine eligibility for study participation.

1. Is the client a female aged 13-19? Yes ____ No ____
2. Is the client receiving treatment via TF-CBT? Yes ____ No ____
3. Can the client speak/read the English language? Yes ____ No ____
4. Has the client been receiving services at the FAC for at least 3 months? Yes ____ No ____
5. Is the client in the custody of a parent or other caregiver other than the Department of Children & Families (DCF)? Yes ____ No ____
6. Does the client possess adequate cognitive abilities to understand all processes of the study (i.e. not diagnosed with Autism Spectrum Disorder and IQ is over 70)? Yes ____ No ____

If you have answered yes to all of the above questions, the client is eligible for the study and may be referred for consent/assent to participate.

Please indicate the type(s) of trauma the client has been exposed to:

_____

_____

Please contact Jessica Feliciano by sending a secure email to Jessica.Feliciano@baystatehealth.org for referrals. Thank you.

Appendix D

Demographic Questionnaire

ID #_____

1. What is your gender? _____Male _____Female
2. What is your age? _____ years old
3. What is your race?
   - _____ Caucasian/White
   - _____ African American/Black
   - _____ Asian/Pacific Islander
   - _____ American Indian or Alaska Native
   - _____ Multi-racial
   - _____ Other
4. Do you identify as Hispanic/Latino? _____ Yes _____ No
5. What grade are you in? _____ 9th _____ 10th _____11th _____12th
6. Do you have any ongoing medical illness? _____ Yes _____ No

   If yes, please explain: _____
7. Are you taking any medications? _____ Yes _____ No

   If yes, please explain: _____

Appendix E

Pre-Yoga Experience Scale – Revised

ID #_____

1. How long have you been practicing yoga? _____

2. On average, how many times per week do you practice yoga? _____

3. Do you practice at home? ___Yes ___No

4. During my yoga practice I feel like…
___I am focused most on learning the postures
___I am relatively comfortable with the postures and I am learning how to breathe
___I am relatively comfortable with the postures and moving with my breath and I am focused on being present in my body

5. I consider yoga to be…
___Something I am trying out
___Part of my exercise routine
___A form of exercise, but also something I have incorporated into other areas of my life.

6. Please place an "X" in the column that best describes the degree to which you currently experience these areas of functioning in your everyday life.

	Not at all	Somewhat	Greatly
Sense of Safety			
Tolerance of stillness			
Tolerance of silence			
Tolerance of others			
Ability to focus			
Ability to relax			
Ability to quiet thoughts			
Ability to manage negative emotions			
Ability to manage anxiety			
Ability to manage challenging experiences			
Patience			
Truthfulness/honesty			
Emotional self-awareness			
Self-appreciation			
Self-acceptance			
Acceptance of others			
Spirituality			
Increased Energy			
Increased Flexibility			

Physical Fitness			
Changes in diet			
Overall Well-Being			
Other. Explain:			

Appendix F

Post-Yoga Experience Scale – Revised

ID#_____

1. How long have you been practicing yoga? _____

2. On average, how many times per week do you practice yoga? _____

3. Do you practice at home? ___Yes ___No

4. During my yoga practice I feel like…
   ___I am focused most on learning the postures
   ___I am relatively comfortable with the postures and I am learning how to breathe
   ___I am relatively comfortable with the postures and moving with my breath and I am focused on being present in my body

5. I consider yoga to be…
   ___Something I am trying out
   ___Part of my exercise routine
   ___A form of exercise, but also something I have incorporated into other areas of my life.

6. Please place an "X" in the column that best describes the degree to which you have noticed an improvement in these areas since beginning yoga.

	Not at all	Somewhat	Greatly
Sense of Safety			
Tolerance of stillness			
Tolerance of silence			
Tolerance of others			
Ability to focus			
Ability to relax			
Ability to quiet thoughts			
Ability to manage negative emotions			
Ability to manage anxiety			
Ability to manage challenging experiences			
Patience			
Truthfulness/honesty			
Emotional self-awareness			
Self-appreciation			
Self-acceptance			
Acceptance of others			
Spirituality			
Increased Energy			
Increased Flexibility			
Physical Fitness			
Changes in diet			
Overall Well-Being			
Other. Explain:			

7. Since practicing yoga, please briefly describe the greatest impact yoga has had on your life:

_____
_____
_____

8. The Class: How do you feel about the yoga classes? (Choose ONE answer in each row)

	Strongly agree	***Agree***	***Neutral***	***Disagree***	***Strongly disagree***
I enjoyed coming to the classes	5	4	3	2	1
The classes made me feel stronger	5	4	3	2	1
The classes made me feel relaxed	5	4	3	2	1
The classes made me feel confident	5	4	3	2	1
The space provided for the class was comfortable	5	4	3	2	1
The space provided for the class was quiet	5	4	3	2	1
I tried my best in each class	5	4	3	2	1

9. The Teacher: What did you think of your yoga teacher or teachers? (Choose ONE answer in each row)

	Strongly agree	***Agree***	***Neutral***	***Disagree***	***Strongly disagree***
The teacher was helpful when someone needed assistance	5	4	3	2	1
The teacher's instructions were always clear	5	4	3	2	1
The teacher seemed to know a lot about yoga	5	4	3	2	1
The teacher used class time well	5	4	3	2	1
I felt safe and respected with the teacher	5	4	3	2	1
The teacher was able to handle any disruptions in a fair and safe way	5	4	3	2	1
The teacher was friendly	5	4	3	2	1

10. Are you interested in taking more yoga? (Choose ONE answer in each row)

	Strongly agree	***Agree***	***Neutral***	***Disagree***	***Strongly Disagree***
I'd like to take another yoga class	5	4	3	2	1
I would encourage a friend or family member to try yoga	5	4	3	2	1
I will continue to do yoga on my own	5	4	3	2	1

11. What did you like about your yoga classes?

_____
_____
_____
_____

12. What could be better about your yoga classes?

_____
_____
_____
_____

13. Please write any other comments you have in the space below:

_____
_____
_____
_____

Appendix G

Beliefs About Yoga Scale (BAYS)

INSTRUCTIONS: For each of these statements, please indicate the extent to which you believe the statement is true by circling the appropriate number.

If I practiced yoga…	Extremely Unlikely	Very Unlikely	Unlikely	Neither	Likely	Very Likely	Extremely Likely
1. I would become more flexible.	1	2	3	4	5	6	7
2. There would only be "new age" people in a class.	1	2	3	4	5	6	7
3. It would help me focus.	1	2	3	4	5	6	7
4. It would help me gain self-awareness.	1	2	3	4	5	6	7
5. I would be embarrassed in a class.	1	2	3	4	5	6	7
6. I would have to be more flexible to take a class.	1	2	3	4	5	6	7
7. It would improve my overall health.	1	2	3	4	5	6	7
8. There would only be women in a class.	1	2	3	4	5	6	7
9. I wouldn't be good at it.	1	2	3	4	5	6	7
10. The teacher would make me uncomfortable.	1	2	3	4	5	6	7
11. It would help me sleep better.	1	2	3	4	5	6	7

Appendix H

Tennessee-Self Concept Scale, Second Edition

Available for purchase through WPS at:
https://www.wpspublish.com/app/

Appendix I

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item:

1	2	3	4	5
Almost Never (0 – 10%)	**Sometimes (11 – 35%)**	**About Half the Time (36 – 65%)**	**Most of the Time (66 – 90%)**	**Almost Always (91 – 100%)**

_____ 1. I am clear about my feelings.

_____ 2. I pay attention to how I feel.

_____ 3. I experience my emotions as overwhelming and out of control.

_____ 4. I have no idea how I am feeling.

_____ 5. I have difficulty making sense out of my feelings.

_____ 6. I am attentive to my feelings.

_____ 7. I know exactly how I am feeling.

_____ 8. I care about what I am feeling.

_____ 9. I am confused about how I feel.

_____ 10. When I'm upset, I acknowledge my emotions.

_____ 11. When I'm upset, I become angry with myself for feeling that way.

_____ 12. When I'm upset, I become embarrassed for feeling that way.

_____ 13. When I'm upset, I have difficulty getting work done.

_____ 14. When I'm upset, I become out of control.

_____ 15. When I'm upset, I believe that I will remain that way for a long time.

_____ 16. When I'm upset, I believe that I will end up feeling very depressed.

_____ 17. When I'm upset, I believe that my feelings are valid and important.

_____ 18. When I'm upset, I have difficulty focusing on other things.

_____ 19. When I'm upset, I feel out of control.

_____ 20. When I'm upset, I can still get things done.

_____ 21. When I'm upset, I feel ashamed at myself for feeling that way.

1	2	3	4	5
Almost Never (0 – 10%)	**Sometimes (11 – 35%)**	**About Half the Time (36 – 65%)**	**Most of the Time (66 – 90%)**	**Almost Always (91 – 100%)**

_____ 22. When I'm upset, I know that I can find a way to eventually feel better.
_____ 23. When I'm upset, I feel like I am weak.
_____ 24. When I'm upset, I feel like I can remain in control of my behaviors.
_____ 25. When I'm upset, I feel guilty for feeling that way.
_____ 26. When I'm upset, I have difficulty concentrating.
_____ 27. When I'm upset, I have difficulty controlling my behaviors.
_____ 28. When I'm upset, I believe there is nothing I can do to make myself feel better.
_____ 29. When I'm upset, I become irritated at myself for feeling that way.
_____ 30. When I'm upset, I start to feel very bad about myself.
_____ 31. When I'm upset, I believe that wallowing in it is all I can do.
_____ 32. When I'm upset, I lose control over my behavior.
_____ 33. When I'm upset, I have difficulty thinking about anything else.
_____ 34. When I'm upset, I take time to figure out what I'm really feeling.
_____ 35. When I'm upset, it takes me a long time to feel better.
_____ 36. When I'm upset, my emotions feel overwhelming.

Appendix J

Cognitive Emotion Regulation Questionnaire-Child Version

See next page.

CERQ-kids

How do you cope with events?

Sometimes nice things happen in your life and sometimes unpleasant things might happen.

When something unpleasant happens, you can think about it for a long time.

When something unpleasant happens to you, what do you usually think?

	(almost) never	some-times	regu-larly	often	(almost) always
1. I think that I am to blame	1	2	3	4	5
2. I think that I have to accept it	1	2	3	4	5
3. Again and again, I think of how I feel about it	1	2	3	4	5
4. I think of nicer things	1	2	3	4	5
5. I think about what would be the best for me to do	1	2	3	4	5
6. I think that I can learn from it	1	2	3	4	5
7. I think that worse things can happen	1	2	3	4	5
8. I often think that it's much worse than what happens to others	1	2	3	4	5
9. I think that others are to blame	1	2	3	4	5
10. I think that I have been stupid	1	2	3	4	5
11. It just happened; there is nothing I can do about it	1	2	3	4	5
12. I often think of what I am thinking and feeling about it	1	2	3	4	5
13. I think of nicer things that have nothing to do with it	1	2	3	4	5
14. I think of how I can cope with it	1	2	3	4	5
15. I think that it makes me feel 'older and wiser'	1	2	3	4	5
16. I think that worse things happen to others	1	2	3	4	5
17. Again and again, I think about how terrible it all is	1	2	3	4	5
18. I think that others have been stupid	1	2	3	4	5
19. I think that it's my own fault	1	2	3	4	5
20. I think that I can't change it	1	2	3	4	5
21. All the time, I think that I want to understand why I feel that way	1	2	3	4	5
22. I think of something nice and not about what happened	1	2	3	4	5
23. I think of how I can change it	1	2	3	4	5
24. I think that there are good sides to it as well	1	2	3	4	5
25. I think that it's not as bad as other things that could happen	1	2	3	4	5
26. All the time, I think that this is the worst thing that can happen to you	1	2	3	4	5
27. I think that it's the fault of others	1	2	3	4	5
28. I think that it's all caused by me	1	2	3	4	5
29. I think that I can't do anything about it	1	2	3	4	5
30. I often think of how I feel about what happened	1	2	3	4	5

31. I think of nice things that have happened to me	1	2	3	4	5
32. I think of what I can do best	1	2	3	4	5
33. I think that it's not all bad	1	2	3	4	5
34. I think that there are worse things in the world	1	2	3	4	5
35. I often think about how horrible the situation was	1	2	3	4	5
36. I think that it's all caused by others	1	2	3	4	5

Thank you for filling out the questionnaire!

Appendix K

Depression, Anxiety, and Stress Scale (DASS)

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found myself getting upset by quite trivial things	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I just couldn't seem to get going	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2	3
8	I found it difficult to relax	0	1	2	3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting upset rather easily	0	1	2	3
12	I felt that I was using a lot of nervous energy	0	1	2	3
13	I felt sad and depressed	0	1	2	3
14	I found myself getting impatient when I was delayed in any way (eg, elevators, traffic lights, being kept waiting)	0	1	2	3
15	I had a feeling of faintness	0	1	2	3
16	I felt that I had lost interest in just about everything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life wasn't worthwhile	0	1	2	3

Reminder of rating scale:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

22	I found it hard to wind down	0	1	2	3
23	I had difficulty in swallowing	0	1	2	3
24	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
26	I felt down-hearted and blue	0	1	2	3
27	I found that I was very irritable	0	1	2	3
28	I felt I was close to panic	0	1	2	3
29	I found it hard to calm down after something upset me	0	1	2	3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31	I was unable to become enthusiastic about anything	0	1	2	3
32	I found it difficult to tolerate interruptions to what I was doing	0	1	2	3
33	I was in a state of nervous tension	0	1	2	3
34	I felt I was pretty worthless	0	1	2	3
35	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
36	I felt terrified	0	1	2	3
37	I could see nothing in the future to be hopeful about	0	1	2	3
38	I felt that life was meaningless	0	1	2	3
39	I found myself getting agitated	0	1	2	3
40	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41	I experienced trembling (eg, in the hands)	0	1	2	3
42	I found it difficult to work up the initiative to do things	0	1	2	3

Appendix L

Depression, Anxiety, and Stress Scale-21 (DASS 21)

DASS 21 NAME _____ DATE _____

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all - NEVER
1 Applied to me to some degree, or some of the time – SOMETIMES
2 Applied to me to a considerable degree, or a good part of time – OFTEN
3 Applied to me very much, or most of the time - ALMOST ALWAYS

		Select 0 1 2 3	FOR OFFICE USE D	A	S
1.	I found it hard to wind down				
2.	I was aware of dryness of my mouth				
3.	I couldn't seem to experience any positive feeling at all				
4.	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)				
5.	I found it difficult to work up the initiative to do things				
6.	I tended to over-react to situations				
7.	I experienced trembling (eg, in the hands)				
8.	I felt that I was using a lot of nervous energy				
9.	I was worried about situations in which I might panic and make a fool of myself				
10.	I felt that I had nothing to look forward to				
11.	I found myself getting agitated				
12.	I found it difficult to relax				
13.	I felt down-hearted and blue				
14.	I was intolerant of anything that kept me from getting on with what I was doing				
15.	I felt I was close to panic				
16.	I was unable to become enthusiastic about anything				
17.	I felt I wasn't worth much as a person				
18.	I felt that I was rather touchy				
19.	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)				
20.	I felt scared without any good reason				
21.	I felt that life was meaningless				
		TOTALS	0	0	0

Appendix M

Youth Outcome Questionnaire (YOQ SR 2.0 and YOQ-2.01-TA)

Available for purchase through OQ Measures at:
https://www.oqmeasures.com/

Appendix N

World Assumptions Questionnaire (WAQ)

Please rate the following statements on how much you agree or disagree with them using the following scale:

1 = Strongly Agree
2 = Agree
3 = Slightly Agree
4 = Slightly Disagree
5 = Disagree
6 = Strongly Disagree

1. Most people can be trusted. *TGP
2. I don't feel in control of the events that happen to me. CE
3. You usually can know what is going to happen in your life. *CE
4. It is difficult for me to take most of what people say at face-value. TGP
5. It is very difficult to know what others are thinking. CPP
6. Anyone can experience a very bad event. SV
7. People often behave in unpredictable ways. CPP
8. People are less safe than they usually realize. SV
9. For the most part, I believe people are good. *TGP
10. I have a great deal of control over what will happen to me in my life. *CE
11. You never know what's going to happen tomorrow. SV
12. Other people are usually trustworthy. *TGP
13. People's lives are very fragile. SV
14. It is hard to know exactly what motivates another person.CPP
15. Most people cannot be trusted. TGP
16. People fool themselves into feeling safe. SV
17. It is hard to understand why people do what they do. CPP
18. Most of what happens to me happens because I choose it. *CE
19. Terrible things might happen to me. SV
20. It is ultimately up to me to determine how events in my life will happen. *CE
21. It can be very difficult to predict other people's behavior. CPP

22. What people say and what they do are often very different things. TGP

Appendix O

UCLA PTSD Reaction Index for DSM-5 Child/Adolescent and Caregiver Versions

Available for purchase from Preston Finley at:

http://www.reactionindex.com

Appendix P

Consent/Assent Form

Baystate Medical Center
Institutional Review Board

Approved on:	11/21/2016
Expires on:	11/21/2017
Study number:	BH-15-201

RESEARCH CONSENT FORM

Title of Project: Yoga as an Adjunctive Treatment for Youth Who Have Experienced Complex Trauma

Study Sponsor: Baystate Family Advocacy Center

Principal Investigator: Jessica Wozniak, PsyD

Study Participant: _____

If you are a parent or guardian of a child under 18 years old, the word "you" in this form refers to the child who will be in the study.

WHY ARE YOU BEING ASKED TO TAKE PART IN THIS RESEARCH?

We are talking to you about this research study because you are the parent or legal guardian of a child who is receiving care from a mental health provider at the Baystate Family Advocacy Center.

This form gives you important information. Please read it carefully and ask questions before you make a decision. Ask your study doctor or the study team to explain any words or information in this form that you do not understand. You may want to talk about this study with your family, your friends, and your other health care providers. Please take your time. You should not sign this form until all of your questions are answered.

Taking part in this study is your choice. No matter what decision you make, and even if your decision changes, there will be no penalty to you. You will not lose medical care, any legal rights, or any benefits that you are otherwise entitled to.

The study doctor will tell you about new information or changes in the study that may affect your willingness to continue in the study.

WHY IS THIS RESEARCH STUDY BEING DONE?

The purpose of this research study is to investigate the effects of practicing yoga on overall mood, behavior, and feelings. The data collected is intended to help increase our knowledge on how yoga works and what benefits this may have for youth who have experienced very stressful life events.

HOW IS THIS RESEARCH STUDY BEING FUNDED?

Some research studies are paid for by the center the study is being conducted in and some by an outside grant or sponsor. This intervention is sponsored by the Baystate Family Advocacy Center.

HOW MANY PEOPLE WILL TAKE PART IN THIS STUDY?

This research is being conducted only at Baystate Medical Center's Family Advocacy Center. We estimate to enroll 30 people here.

HOW LONG WILL YOU BE IN THIS STUDY?

Your participation in this research study is expected to last for a total of 10 weeks. You will complete initial surveys, which will take approximately 1 ½-2 hours. You will also participate in a trauma-sensitive yoga class for six weeks, with each class being one hour long. You will complete outcome surveys two more times after finishing the yoga classes, which will take about 1-1 ½ hours each. You will need to visit Baystate Family Advocacy Center six times for the yoga classes, and two times afterwards to complete surveys: Once within one week of completing the yoga intervention, and once after four weeks to complete follow-up surveys.

CAN I STOP TAKING PART IN THIS STUDY?

Tell the study doctor if you have decided to or are thinking about leaving the study. Information that has already been collected about you will remain part of the study. The results from any surveys that have already been done cannot be taken back, but no further surveys will be done. The study doctor will not request to follow your medical record information if you decide to stop taking part in the study.

Please note that if you decide to stop participating in the study or if you miss two yoga classes in a row, you will no longer be eligible to take home your props at the end of the study.

The study doctor may take you out of the study:

- If your health changes and the study is no longer in your best interest
- If new information becomes available
- If you do not follow the study rules
- If the study is stopped by the sponsor

WHAT WILL HAPPEN IN THIS STUDY?

1. If you are interested in participating, you will sign this consent form (we will give you a copy) and one survey.
2. You will meet with study staff before beginning the yoga classes to complete several baseline surveys about your background, mood, behavior, and self-concept.
3. You will attend a total of six trauma-sensitive yoga classes taught by a certified yoga teacher.

4. You will meet once with study staff within one week of completing the yoga classes to complete follow-up surveys about your mood, behavior, and self-concept.
5. One month later, you will meet one final time with study staff to complete follow-up surveys about your mood, behavior, and self-concept.

NOTE: If you miss two yoga classes in a row, you will no longer be eligible to participate and study staff will withdraw you from the study. You will not be eligible to take home your props for participating if you are withdrawn from the study for this reason.

WHAT RISKS OR PROBLEMS COULD YOU HAVE BY BEING IN THIS STUDY?

All risks will be minimized throughout the study. The questionnaires and surveys include some questions that may be sensitive or personal. You are free to skip any question for any reason.

The certified yoga teacher will be leading the class using a type of yoga that is gentle on the body with no complex poses and does not place significant strain on the body. Props such as chairs, bolsters, and blocks will also be available to use to make poses easier. Common yoga injuries include minor back and spinal problems, neck injuries, shoulder and hamstring injuries, as well as ankle, wrist, and knee injuries, but there are no available data on the frequency of these injuries. There is also a risk that yoga may cause an emotional response.

WE WILL DO THE FOLLOWING TO DECREASE THE RISKS OF THIS STUDY:

Survey questions were designed to minimize discomfort. You are free to skip any question for any reason.

The yoga teacher will begin every class with asking if anyone has any injuries that she should know about that may impact their practice. She will then suggest modified poses to avoid any further injury.

A psychologist will be available and on-call at the Baystate Family Advocacy Center to discuss any thoughts and feelings that arise during a class. If you experience distressing reactions or if there is any concern about your wellbeing, the yoga teacher will advise the study researcher, who will inform your mental health provider of any concerns that can be addressed in treatment.

A safety protocol is also in place to ensure your safety. One of the surveys, the Youth Outcome Questionnaire (YOQ), has two questions about thoughts of self-harm or harm to others that will be checked immediately after you complete it. If applicable, the study staff will contact a licensed clinical psychologist or clinician to conduct a risk assessment and refer to appropriate services if needed.

We will take steps to protect the confidentiality of your research information. These steps are described in more detail later in this form.

WILL YOU BENEFIT FROM BEING IN THIS STUDY?

You may or may not benefit from being in this study. It is possible that the yoga class could have a positive impact on your overall psychological wellbeing, but we don't know if this will happen. What we learn from this research study may help other people who have been exposed to very stressful life events in the future. No other benefits such as academic or subject pool credit will be offered. There is also the possibility that no benefit will come from this study.

WHAT OPTIONS OTHER THAN THIS STUDY ARE AVAILABLE TO YOU?

Your alternative is to not participate in the study. You should continue with your regular doctor whether you are in this study or not.

WILL BEING IN THE STUDY COST YOU ANYTHING?

Research-related services are not the responsibility of you or your insurance. The procedures or items that are considered research-related in this study include the following: Study surveys and yoga intervention. Being in this study will not cost you anything.

Usual medical care costs include those services that are considered medically necessary to manage your condition. The costs of usual medical care will be the responsibility of you or your insurance and may include deductibles and co-payments. Although unusual, some insurance companies will not pay for usual medical care if you are participating in a research study.

WILL YOU RECEIVE ANY PAYMENTS OR GIFTS FOR PARTICIPATING?

At the end of the study you will be able to keep and take home the props you used in the yoga classes. If you miss two yoga classes in a row, you will no longer be eligible to complete the study and you will not be able to keep the yoga props you used.

Baystate will keep a record of any money you are paid, your name, address, and social security number. If Baystate Medical Center pays you more than $600 in a calendar year (or if you are a foreign citizen who is not here as a permanent resident), we must report the payment to the IRS (Internal Revenue Service) and send you a 1099 form.

HOW WILL YOUR PRIVACY AND INFORMATION ABOUT YOU BE PROTECTED?

We will protect your privacy as a participant in this research study and the confidentiality of your research information. Your study visits will take place in a private conference size room at the Baystate Family Advocacy Center on 50 Maple Street. When we call you we will verify your identity by first and last name.

All completed surveys will be stored in a locked filing cabinet within a secured room at the Baystate Family Advocacy Center at 50 Maple Street. All collected survey information will be entered into a secured file, which will exclude your name and replace it with a code. Data will

be stored for a minimum of five years following publication of research findings. Information sent to the study sponsor and research laboratories will not include information that can directly identify you such as your name and address, instead your name will be replaced by a code.

We may be required by law to report some information (for example; certain infectious diseases, suspected abuse) to a state agency for public health or safety reasons.

INFORMATION ABOUT THE PRIVACY OF PROTECTED HEALTH INFORMATION

Baystate Health has rules in place to protect information about you. Federal and state laws also protect your privacy. This part of the consent form tells you what information about you may be collected in this study and who might see or use it.

Generally, only people on the research team will know that you are in the research study and will see your information. However, there are a few exceptions that are listed later in this section of the consent form.

The people working on the study will collect information about you. This includes things learned from the procedures described in this consent form and may include information from your medical record if needed for the study. They may collect other information including your name, address, date of birth, and other details.

The research team will need to see your information. Sometimes other people at Baystate may see or give out your information. These include people who review the research studies, their staff, administrative personnel, or other Baystate staff.

The fact that you are taking part in this study and information from procedures (such as lab tests) that are done for the research may become part of your medical record.

If we publish information from this research study or use it for teaching, your name will not be used.

People outside of Baystate may need to see your information for this study. Examples include government groups (such as the Food and Drug Administration), organizations that accredit hospitals and research programs, study monitors, other hospitals in the study, and companies that sponsor the study.

We cannot do this study without your permission to use and give out your information. You do not have to give us this permission. If you do not, then you may not join this study.

We will use and disclose your information only as described in this form and in our Notice of Privacy Practices; however, people outside of Baystate who receive your information may not be covered by this promise. We try to make sure that everyone who needs to see your information keeps it confidential – but we cannot guarantee this.

The use and disclosure of your information has no time limit. You can cancel your permission to use and disclose your information at any time by contacting the Principal Investigator of this study. The Principal Investigator can be reached at:

Jessica Wozniak, PsyD
50 Maple Street
Springfield, MA 01103
Phone: 413-794-9816
Fax: 413-794-4945

If you send a letter, please be sure to include the study name and your contact information.

If you do cancel your permission to use and disclose your information, your part in this study will end and no further information about you will be collected. Your cancellation would not affect information already collected in this study.

You can ask to see your research records but sometimes that can only happen after the research is completed. If you would like to see your research records please discuss this with your study doctor or a member of the research team.

WHO DO YOU CONTACT IF YOU HAVE STUDY QUESTIONS OR CONCERNS?

If you have any questions about this study, please contact: Jessica Wozniak, PsyD or Jessica Silva at 413-794-9816. If you experience a complication or injury that you believe may be related to this study, please contact: Dr. Jessica Wozniak, PsyD at 413-794-9816, and ask to have Dr. Wozniak paged.

If you would like to discuss your rights as a research participant, or wish to speak with someone not directly involved in the study, please contact the Baystate Institutional Review Board (IRB) at (413) 794-4356.

STATEMENT OF VOLUNTARY CONSENT

I have read this form or have had it read to me. I have been told what to expect if I take part in this study, including possible risks and possible benefits. I have had a chance to ask questions and have had them answered to my satisfaction. I have been told that the people listed in this form will answer any questions that I have in the future. By signing below, I am volunteering to be in this research study and authorizing the use of my information for the research.

Participant's Name (Print): _____

Signature: _____ Date: _____

(If Applicable) Legal Representative's Name (Print): _____

Relationship to Participant (*ex. Parent, Spouse, Legal Guardian*) (Print): _____

Signature: _____ Date: _____

Legal Representative's Name (Print): _____

Relationship to Participant (*ex. Parent, Spouse, Legal Guardian*) (Print): _____

Signature: _____ Date: _____

Witness's Name (Print): _____

Signature: _____ Date: _____

Reason for Use of Witness: _____

STUDY REPRESENTATIVE STATEMENT

I have explained the purpose of the research, the study procedures, the possible risks and discomforts, the possible benefits, and have answered all questions to the best of my ability.

Study Representative's Name (Print): _____

Signature: _____

Date: _____ Time Consent Obtained: _____

You will receive a copy of this form after it has been signed and date

CHILD'S ASSENT FORM FOR BEING IN A RESEARCH STUDY

Name of Research Study: Yoga as an Adjunctive Treatment for Youth Who Have Experienced Complex Trauma

_____ has talked to me about what research is and what will happen if I am in this study, and answered my questions. I know that being in this research study might not help me to feel better. I know that I do not have to be in this study, being in this study is up to me and my doctor won't be mad at me if I don't join. I can change my mind later and stop being in the study. My parent or guardian can also take me out of the study at any time. Signing my name on this form means that I agree to be in this study.

Participant's Name (Print): _____

Signature: _____ **Date:** _____

Legal Representative's Name (Print): _____

Relationship to Participant (*ex. Parent, Legal Guardian*) (Print): _____

Signature: _____ **Date:** _____

STUDY REPRESENTATIVE STATEMENT

I have explained in terms understandable to this child all of the following: the purpose of the research, the study procedures, the possible risks and discomforts, and the possible benefits. I have answered all of the child's and his/her parent(s') or guardian(s') questions to the best of my ability.

Study Representative's Name (Print): _____

Signature: _____

Date: _____ **Time Assent Obtained:** _____

You will receive a copy of this form after it has been signed and dated.

You have been taking part in the research study: Yoga as an Adjunctive Treatment for Youth Who Have Experienced Complex Trauma. Consent for your participation was initially obtained from your parent(s) or legal representative because you were either a minor or were unable to provide consent at that time. We are now asking for you to consent to continue being in the study. Your continued participation is entirely voluntary. No matter what decision you make, and even if your decision changes, there will be no penalty to you. You will not lose medical care, any legal rights, or any benefits that you are otherwise entitled to.

STATEMENT OF VOLUNTARY CONSENT

I have read this form and the attached consent or have had them read to me. I have been told what to expect if I take part in this study, including risks and possible benefits. I have had a chance to ask questions and have had them answered to my satisfaction. I have been told that the people listed in this form will answer any questions that I have in the future. By signing below, I am volunteering to continue to be in this research study and am authorizing the use of my information for the research.

Participant's Name (Print): _____

Signature: _____ Date: _____

(If Required) Witness's Name (Print): _____

Signature: _____ Date: _____

Witness to: ☐ Discussion ☐ Signature
Reason for Use of Witness: _____

STUDY REPRESENTATIVE STATEMENT

I have explained the purpose of the research, the study procedures, the possible risks and discomforts, the possible benefits, and have answered all questions to the best of my ability.

Study Representative's Name (Print): _____

Signature: _____

Date: _____ Time Consent Obtained: _____

You will receive a copy of this form after it has been signed and dated.