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# EXPLORING RESEARCH-BASED YOGA INTERVENTIONS TARGETING UNDERSERVED WOMEN AND SEXUAL TRAUMA: A DESCRIPTIVE STUDY

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**EXPLORING RESEARCH-BASED YOGA INTERVENTIONS TARGETING  
UNDERSERVED WOMEN AND SEXUAL TRAUMA: A DESCRIPTIVE STUDY**

By

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Professional Paper

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Exploring Research-Based Yoga Interventions Targeting Underserved Women and Sexual Trauma: A Descriptive Study

Chairperson: Dr. Laura Dybdal

## BACKGROUND

Racial/ethnic, minority women of low socioeconomic status are disproportionately affected by sexual assault and are more likely to develop PTSD. Women's social, economic and environmental circumstance may contribute to this disadvantage. Yoga has shown to reduce symptoms of PTSD in underserved women. However, it is unknown whether yoga interventions for underserved women who have experienced sexual trauma in the research literature are theory-based and whether constructs are consistent across interventions. Furthermore, it is unknown whether existing trauma-based yoga training programs incorporate similar constructs found in yoga interventions for underserved women who have experienced sexual trauma.

## METHODS

A descriptive research design was used to better understand the theory and standardized framework, or lack thereof, behind yoga interventions for underserved women who have experienced sexual trauma. Additionally, whether perceived "Gold Standard" trauma-based yoga training programs include constructs relevant to underserved women were explored.

## RESULTS

Limited theory was used within yoga interventions for underserved women who have experienced trauma. However, various isolated constructs related to theory were applied. There were more theoretical similarities than differences across yoga interventions for underserved women who have experienced trauma. However, further research on yoga interventions for underserved women who have experienced sexual trauma is needed. Currently, there is only one trauma-based training program, Trauma-Sensitive Yoga (TSY), that meets the perceived "gold standard" in the United States. Further, constructs applied in TSY may be too narrow to capture specific needs of underserved women who have experienced trauma.

## RECOMMENDATIONS

Further research on yoga interventions for underserved women who have experienced sexual trauma is needed to assess the effectiveness of theory-based interventions for this population. It is recommended that TSY and other "Gold Standard" trauma-based yoga training programs are adapted based on theory and theoretical constructs found in the research literature regarding effective yoga interventions for underserved women who have experienced trauma. Recommendations include adding constructs related to an ecological theoretical perspective, gender-responsive strategies, and constructs from trauma theory such as cognition and skill-building. Additionally, a program planning model such as a

Generalized Model for Program Planning should be used throughout development, implementation and evaluation.

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# CHAPTER 1: INTRODUCTION

## BACKGROUND

Individuals throughout the United States and world experience traumatic events at alarming rates (Atwoli, Stein, Koenen & McLaughlin, 2015; Benjet et al., 2016). Though trauma affects a wide variety of individuals, specific events are more prevalent in racial/ethnic minority women of low socioeconomic status (SES) (Hatch & Dohrenwend, 2007; Basile et al., 2011; U.S. Department of Veterans Affairs, 2015; Roberts et al., 2011). For the purpose of this paper, women will be referred to as “underserved” if they are racial/ethnic minority women of low SES.

Women experience violence, rape and other sexual assault, or “sexual trauma”, at higher rates than men (Hatch & Dohrenwend, 2007), and are more likely to develop PTSD (10% and 4%, respectively) (U.S. Department of Veterans Affairs, 2015; American Psychological Association, 2017). Blacks and Hispanics report higher rates of witnessing domestic violence and child maltreatment compared to Whites, and exposure to assaultive violence is higher among Blacks than Whites (Hatch & Dohrenwend, 2007; Roberts et al., 2011). Significant forces that reside in one’s social, economic and environmental circumstance may contribute to this disadvantage as well (Bair-Merritt, 2010; WHO, 2014). For example, 70% of 115 studies reviewed by the World Health Organization (2014) found a positive association between poverty measures (i.e. debt, educational attainment, material disadvantage and unemployment) and mental disorders such as PTSD (WHO, 2014). Underserved women may be more vulnerable to sexual trauma and more likely to develop PTSD due to poverty, social isolation, and disparities in social and economic resources (Stockman, Hayashi & Campbell, 2015).

Many survivors of sexual trauma experience long-term symptoms such as nightmares, fear, anxiety, shame, difficulty with relationships, isolation (American Psychological Association, 2017), impaired immune function (Woods et al., 2005) and chronic pain (Outcalt et al., 2014). Underserved women, in particular, experience unique symptoms and lifestyle factors related to PTSD (Tolin & Foa, 2006; Koss & Helset, 2009; Dutton et al., 2013). Additionally, sex-differences such as internalizing disorders (anxiety and depression), premenstrual problems and chronic pelvic pain have been found to occur more frequently in women than men (Tolin & Foa, 2006; Koss & Helset, 2009). Underserved women may also face barriers accessing and utilizing treatment and

recovering from symptoms due to an accumulation of life stressors (Dutton et al., 2013). Specifically, barriers may include poverty, racial discrimination, family instability and internalized stigma, and contribute to a lack of help-seeking behaviors (Dutton et al., 2013). Because of these factors and circumstances, it may be important to conceptualize the experiences of underserved women who are healing from sexual trauma in order to inform recovery (Herman, 1997; Sahar, Shalev & Porges 2001; Covington, 2002; Wasco, 2003). To facilitate the healing process of sexual trauma, efforts exist to better understand one's response to and the impact of sexual trauma (van der Kolk, 2006; Goodman & Calderon, 2012), along with various treatments for PTSD (Pennebaker, 1988; Seedat et al., 2005; Johnson et al., 2011).

Many conventional treatments exist, addressing important aspects of PTSD such as cognition, or the processing of experience (Pennebaker, 1988; Johnson et al., 2011), and symptoms related to re-experiencing, avoidance, numbing, and hyperarousal (Seedat et al., 2005). Cognitive Behavioral Therapy (CBT), which incorporates psychotherapy (verbal/talk therapy), focuses on cognition (Johnson et al., 2011), while pharmacotherapy, or medication, attempts to alleviate specific symptoms of PTSD (Seedat et al., 2005). Conventional treatments such as CBT, psychotherapy and pharmacotherapy have been shown to effectively reduce PTSD symptoms (Pennebaker, 1988; Seedat et al., 2005; Johnson et al., 2011). However, underserved women may be unlikely to seek or receive conventional treatment due to sociodemographic factors in obtaining quality support and health care (Stockman et al., 2015). Making services accessible for underserved women suffering from trauma may provide an avenue to overcome barriers to care (Dutton et al., 2013). Additionally, McEwen and Gianaros (2010) suggest treatment should be approached holistically and from a broader scope than current practices.

Traumatic stress affects the mind, body, relationships and quality of life in individuals (Kozłowska et al., 2015). The research literature provides evidence for the efficacy of mind-body based therapies in the reduction of PTSD symptoms such as mindfulness-based interventions (Shapiro et al., 2006; Jha et al., 2010; Smith et al., 2011; Vujanovic et al., 2011; Niles et al., 2012; Dutton et al., 2013; Sipe & Eisendrath, 2012; Khusid & Vythilingam, 2016), somatic experiencing (Payne, Levine & Crane-Godreau, 2015), Qigong and T'ai Chi (Grodin et al., 2008), dance (Harris, 2007; Homann, 2010) and yoga (Price et al., 2017).

Yoga in particular has shown to reduce symptoms of PTSD in a variety of populations (Carter et al., 2013; Staples, Hamilton, & Uddo, 2013), including women (Dick, Niles, Street, DiMartino & Mitchell, 2014; Rhodes, 2015; Rhodes, Spinazzola & van der Kolk, 2016; Price et al., 2017). Trauma-based yoga interventions and programs, in particular, are comprised of elements which target symptoms of the disorder such as dissociation, hypervigilance, avoidance and numbing (Khusid & Vythillingam, 2016). Yoga has also been identified as a flexible intervention that can be individualized and adapted to various environments (Dutton et al., 2013; Stockman et al., 2015). Additionally, trauma-based yoga training programs have been incorporated into nonprofit organizations perhaps in an effort to address social determinants and health disparities among underserved populations (Give Back Yoga Foundation, 2017; Off the Mat and Into the World, 2017).

Although there is a growing body of research surrounding yoga and PTSD, it is unknown whether yoga interventions for underserved women who have experienced sexual trauma in the research literature are theory-based and whether constructs are consistent across interventions (Stoller et al., 2011; Staples, Hamilton & Uddo, 2013; Dutton et al., 2013; van der Kolk, 2014). Furthermore, it is unknown whether existing trauma-based yoga training programs incorporate similar constructs found in yoga interventions for underserved women who have experienced sexual trauma. Therefore, a descriptive research design was used to better understand the theory and standardized framework, or lack thereof, behind yoga interventions for underserved women who have experienced sexual trauma. Additionally, whether trauma-based yoga training programs include constructs relevant to underserved women were explored.

## STATEMENT OF PROBLEM

Though human beings are resilient and capable of overcoming challenges associated with traumatic events, the prevalence of PTSD is considerably high (PTSD Statistics, 2013; WHO, 2017). Underserved populations, especially women, face a number of social challenges, which contribute to a higher risk of developing mental health disorders and PTSD (Satcher, 2010; WHO, 2014). There are efforts that exist to mitigate symptoms associated with PTSD (Pennebaker, 1988; Seedat et al., 2005; Van der Kolk, 2006; McEwen and Gianaros, 2010; Johnson et al., 2011). For example, Trauma-Sensitive Yoga (TSY) and trauma-informed yoga interventions have been shown to reduce symptoms of PTSD in women (Rhodes, 2015) and lead to other positive outcomes

(Rhodes, 2015; Smoyer, 2016). Additionally, trauma-based yoga training programs may train individuals who work within the nonprofit sector, and perhaps make treatment more accessible to women in underserved populations. However, it is unknown whether these trauma-based yoga training programs are based on theory and incorporate constructs found in interventions specifically for underserved women who have experienced sexual trauma.

## PURPOSE OF RESEARCH

The first aim of this research was to describe theories used in research-based yoga interventions for underserved women who have experienced sexual trauma, highlighting similarities and differences across interventions. The second aim was to describe positive outcomes reported for underserved women who have experienced sexual trauma. The third aim was to describe theories and constructs used in the perceived “gold standard” or “evidence-based”, trauma-based yoga training programs in the United States. Finally, the fourth aim was to determine whether “gold standard” trauma-based yoga training programs incorporated constructs similar to research-based yoga interventions for underserved women who have experienced sexual trauma. Collectively, this research provided information for the development of an adapted trauma-based yoga training program that is theory-driven and standardized and addresses the unique experiences of underserved women who have experienced sexual trauma.

## SIGNIFICANCE OF RESEARCH

Information from this research will be used to increase awareness of the current state of the perceived “gold standard” or “evidence based”, trauma-based yoga training program in the United States, and to identify how the existing training program reflects research-based yoga interventions specific to underserved women who have experienced sexual trauma. Executive Directors, program coordinators and yoga teachers within nonprofit and for-profit organizations who may utilize this perceived “gold standard”, trauma-based yoga training program, will gain a better understanding of constructs that are supported by research, and positive outcomes resulting from yoga interventions for underserved women who have experienced sexual trauma. These individuals may also gain insight as to the strengths of existing programs, and ways to standardize and adapt their current programs to better serve underserved women who have experienced sexual trauma.

## QUESTIONS

### I. **How are yoga interventions for underserved women who have experienced sexual trauma described in the research literature?**

- A. What theories are incorporated into yoga interventions for underserved women who have experienced sexual trauma?
  - a) What theory constructs are applied in yoga interventions for underserved women who have experienced sexual trauma?
  - b) Which theories or constructs are similar and/or different across yoga interventions for underserved women who have experienced sexual trauma?
- B. What are the reported positive outcomes within the yoga interventions for underserved women who have experienced sexual trauma?

### II. **How are the perceived “gold standard”<sup>1</sup>, trauma-based yoga training programs in the United States described?**

- A. What theories are incorporated into perceived “gold standard”, trauma-based yoga training programs in the United States?
- B. How do the perceived “gold standard”, trauma-based yoga training programs in the United States incorporate constructs from yoga interventions for underserved women who have experienced sexual trauma?

## DELIMITATIONS

1. Information for yoga interventions were collected through published articles from an electronic database.
2. Published articles were limited to peer reviewed, published between 2007 and 2017, and on specific topics such as yoga, PTSD, trauma, sexual trauma, and underserved women
3. Yoga interventions from the research literature were specific to underserved women who have experienced trauma.

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<sup>1</sup> A trauma-based yoga training program that “has been thoroughly tested in a randomized controlled trial and has a reputation in the field as a reliable method” (Cardoso, Pereira, Iversen, & Ramos, 2014; Bothwell, Greene, Podolsky, & Jones, 2016). Additionally, a “gold-standard” or “evidence-based”, trauma-based yoga training program also requires applicants to be a certified yoga instructor or at least a master’s level mental health care provider and requires 100+ hours or more to obtain certification (Dutton et al., 2013).

4. Information for perceived “gold standard”, trauma-based yoga training programs were collected through an internet search and through a snowball effect.
5. Trauma-based yoga training programs were limited to those that met inclusion criteria for the perceived “gold standard”.

## LIMITATIONS

1. The representativeness of information for yoga interventions could be problematic. Information collected were limited to the Maureen and Mike Mansfield Library database at the University of Montana, and to specific databases. Databases included: Anthropological Index Online, JSTOR, PILOTS, PsychINFO, PubMed and Google Scholar. Only using these selected databases could potentially exclude relevant articles located within databases not used.
2. The representativeness of information for the perceived “gold standard”, trauma-based yoga training programs could be problematic. Information were collected using an internet search and snowball effect. Due to the breadth of available information, it is possible that trauma-based yoga training programs that meet the inclusion criteria were missed. Additionally, there is not a nationally recognized “gold standard” for trauma-based yoga training programs. Therefore, the definition of the perceived “gold standard” was described specifically for this paper.
3. The measurement of key concepts may differ between published articles. Differences may include descriptors of the sample. For example, studies may look at Hispanic or Latina, African American, or Native American women. All victims may meet criteria for PTSD or may have experienced trauma or sexual trauma but may respond to trauma differently. Therefore, various populations may heal from sexual trauma differently.
4. Not all yoga interventions for underserved women included individuals who had explicitly experienced sexual trauma. Participants may have had multiple traumas of varying degrees or were diagnosed with co-morbid disorders. Therefore, other considerations may need to be taken into account when women are healing from multiple traumas not related to sexual violence or abuse.



## DEFINITION OF TERMS

*Allotaxis*: one's ability to maintain physiological stability through environmental changes (Danese & McEwen, 2012)

*ANS*: Autonomic nervous system (Goodman & Calderon, 2012)

*CBT*: Cognitive-Behavioral Therapy (Johnson et al., 2011)

*Complex trauma*: Chronic trauma that is prolonged or repeated. The victim is generally held in a state of captivity, physically or emotionally, and cannot get away from the danger (National Center for PTSD, 2016).

*Embodiment*: "felt sense" - bringing awareness inside the body; qualities of present, internal experience (Payne et al., 2015)

*(Perceived) Gold Standard*: A trauma-based yoga training program that "has been thoroughly tested in a randomized controlled trial and has a reputation in the field as a reliable method" (Cardoso, Pereira, Iversen, & Ramos, 2014; Bothwell, Greene, Podolsky, & Jones, 2016). Additionally, a "gold-standard" or "evidence-based", trauma-based yoga training program also requires applicants to be a certified yoga instructor or at least a master's level mental health care provider and requires 100+ hours or more to obtain certification (Dutton et al., 2013).

*Health Disparities*: Differences in access to or availability of facilities and services or variation in rates of disorder occurrence between socioeconomic population groups (Carter-Pokras & Baquet, 2002)

*Interoceptive Awareness*: Awareness of sensations experienced within the body (i.e. temperature, pain, tingling sensations, etc.) (Payne, et al., 2015)

*Intimate Partner*: Person who is considered close and personal in a relationship characterized by emotional connectedness, regular contact, ongoing physical contact and/or sexual behavior, identity as a couple, and familiarity and knowledge about each other's lives (spouses, boyfriends or girlfriends, dating partners, sexual partners; can be between heterosexual or same-sex couples) (Baier-Merritt, 2010)

*IPV*: Intimate Partner Violence - Physical violence, sexual violence, stalking and psychological aggression by a current or former intimate partner (Baier-Merritt, 2010)

*Kinesthetic Awareness*: Learning through feeling the body's motions and movement patterns (Payne, et al., 2015)

*Mindfulness*: Construct related to focusing one's attention on the present experience without any judgment (Niles et al., 2012)

*PNS*: Parasympathetic nervous system (Goodman & Calderon, 2012)

*PTSD*: Posttraumatic Stress Disorder (APA, 2013)

*Therapeutic Yoga:* Based on the Professional Yoga Therapy Institute (PYTI) definition: is the practice of yoga in medicine, rehabilitation, and wellness settings by a licensed health care professional who is completing or has graduated from the Professional Yoga Therapy Institute program and has been credentialed as a Professional Yoga Therapist-Candidate or Professional Yoga Therapist (Professional Yoga Therapy Studies, 2015).

*Proprioceptive Awareness:* Awareness that focuses on body motions and movement patterns in space (Payne et al., 2015)

*Psychosomatic:* Physical symptoms caused by emotional or psychological factors (van der Kolk, 2014)

*SES:* Socioeconomic status (Hatch & Dohrenwend, 2007)

*Social Determinants:* Conditions in which people are born, grow, live, work and age; circumstances are shaped by the distribution of money, power and resources (Carter-Pokras & Baquet, 2002).

*SNS:* Sympathetic nervous system (Goodman & Calderon, 2012)

*Trauma-Based Yoga:* An umbrella term encompassing “trauma-informed yoga”, “Trauma-Sensitive Yoga”, and yoga training programs that are sensitive to trauma (i.e. “trauma-based yoga training programs”)

*Trauma-Informed Yoga:* Goal is to help bring an individual back into one’s body, gain control of emotions and alleviate any symptoms of trauma; Less formal and less structured; does not require a certified yoga instructor (Henderer, 2017); utilizes principals and intentions of TSY, but is less structured – developed due to limited resources (Smoyer, 2016).

*Trauma-Sensitive Yoga (TSY):* Goal is to help bring an individual back into one’s body, gain control of emotions and alleviate any symptoms of trauma; Must be taught by a certified trauma-yoga teacher and follow the Trauma Center’s exact protocol (Henderer, 2017)

*Underserved Populations:* Individuals categorized based on race, ethnicity, economic status and health outcomes; **Racial/ethnic minority women of low socioeconomic status** (Hatch & Dohrenwend, 2007)

*Yoga:* “Union” – goal of connecting one’s mind, body and spirit harmoniously (Woodyard, 2011)

*Yoga Service:* The intentional sharing of yoga practices that support healing and build resilience for all regardless of circumstances, taught within a context of conscious relationship rooted in self-reflection and self-inquiry (Childress & Cohen Harper, 2016)

*Yoga Therapy:* Based on the International Association of Yoga Therapists (IAYT) definition, yoga therapy is different from teaching yoga in general in many ways, including: specialized training that includes supporting a therapeutic relationship, “eliminating, reducing or managing symptoms

that cause suffering”, “improving function”, preventing underlying causes of illness, and changing the “relationship to and identification with a client’s condition” (Sullivan, 2017).

## **CHAPTER 2: REVIEW OF LITERATURE**

### **TRAUMA EXPOSURE**

An individual may have experienced trauma if one has been victimized, witnessed a violent act, been repeatedly exposed to life-threatening situations (U.S. Department of Veterans Affairs, 2015), or learned an event occurred to a close family member or friend (APA, 2013; U.S. Department of Veterans Affairs, 2015). In the United States alone, seventy percent of adults have experienced some sort of traumatic event at least once in their lives; approximately 223.4 million people (PTSD United, 2013). Though trauma affects a wide variety of individuals, trauma disproportionately affects individuals based on gender, racial/ethnic background, and socioeconomic status (Hatch & Dohrenwend, 2007).

#### **Prevalence and Risk Factors of Sexual Trauma Exposure**

Research suggests that specific traumatic and stressful events are more prevalent in women (Hatch & Dohrenwend, 2007; Basile et al., 2011; U.S. Department of Veterans Affairs, 2015). Of all women, more than half will experience at least one traumatic event in one's life, with the majority related to sexual assault or child sexual abuse (U.S. Department of Veterans Affairs, 2015; Benjet et al., 2016). Women report experiencing violence, rape and other sexual assault at higher rates than men. (Hatch & Dohrenwend, 2007). For example, in the United States alone, 1.3 million women are assaulted by an intimate partner every year, compared to 835,000 men (Basile et al., 2011). Approximately fifty percent of adult rape victims have previously been victimized in childhood (Cloitre, Scarvalone & Difede, 1997). Among female victims who experience attempted or completed rape, 42.2% were first victimized before the age of 18, 29.9% between 11-17 years old, and 12.3% under the age of 10 (Basile et al., 2011). Additionally, women abused as children are at higher risk for sexual re-victimization in adulthood (Cloitre et al., 1997). Not only are women more at risk of exposure to trauma (Hatch & Dohrenwend, 2007; Basile et al., 2011; U.S. Department of Veterans Affairs, 2015; Benjet et al., 2016), but the racial/ethnic backgrounds of women also play a role in this heightened risk (Roberts et al., 2011).

Though trauma affects individuals of all demographics, racial/ethnic minority women are at a greater risk of being exposed to specific traumatic events (Roberts et al., 2011). Roberts et al. (2011) found that Blacks and Hispanics reported higher rates of witnessing domestic violence and

child maltreatment compared to Whites, and exposure to assaultive violence was higher among Blacks than Whites (Hatch & Dohrenwend, 2007; Roberts et al., 2011). Intimate partner violence (IPV), in particular, disproportionately affects racial/ethnic minority women (Stockman, Hayashi & Campbell, 2015). In the United States, 42.4 million women have experienced stalking, physical violence and/or rape by an intimate partner in one's lifetime. Non-Hispanic Black and Native American/Alaska Native women report even higher rates of IPV (43.7% and 46%, respectively), along with Hispanic women (37.1%), compared to non-Hispanic White women (34.6%) (Stockman, et al., 2015).

Women with a racial/ethnic minority background may be predisposed to trauma exposure, especially in relation to physical and sexual assault. (Hatch & Dohrenwend, 2007; Roberts et al., 2011; Stockman, et al., 2015). There are also significant forces that reside in one's social, economic and environmental circumstance that contribute to this disadvantage as well (Bair-Merritt, 2010; WHO, 2014). The World Health Organization (2014) suggests that "the greater the inequality [in one's social, economic or environmental circumstance], the higher the inequality in the risk [for trauma exposure]" (WHO, 2014, p. 09). For example, low socioeconomic status has been linked to a higher prevalence in IPV and sexual violence (Baier-Merritt, 2010; Planty et al., 2013). Prevalence rates of IPV with household incomes ranging from \$25,000 to \$50,000 are at 5.9%, compared to 9.7% for households with incomes under \$25,000 per year (Breiding, 2014). Furthermore, Planty et al. (2013) found that between 2005 and 2010, females under the age of thirty-four, living in lower income households experienced the highest rates of sexual violence. Racial/ethnic minority women who are of low SES, or underserved, may be more vulnerable to these types of traumatic events due to poverty, social isolation, and disparities in social and economic resources (Stockman et al., 2015). As the research literature suggests, one's circumstance, or conditions which women are born, grow, work and live (NIH, 2009) may influence risk for or resilience against maladaptation to stress (McEwen & Gianaros, 2010).

## SOCIAL DETERMINANTS OF HEALTH

Epidemiological data and the research literature provide evidence that exposure to traumatic events, especially sexual trauma, is problematic in women belonging to racial/ethnic minority groups, and of low SES (Hatch & Dohrenwend, 2007; Basile et al., 2011; Roberts et al., 2011; Basile et al., 2011). There may be unique life experiences underserved women face that expose

women to and constrain recovery from traumatic events (Tolin & Foa, 2006; Koss & Heslet, 2009; Dutton et al., 2013). Underserved women may be more vulnerable and disproportionately exposed to trauma due to poverty and a feeling of social isolation after IPV or sexual violence exposure. Ethnic minority women, particularly African Americans and Indigenous Americans, report medical mistrust, perceived discrimination, and historical racism and trauma. These women are more likely to seek help from informal support systems such as family or friends, rather than health providers or mental health professionals (Stockman et al., 2015).

Black and Latina women are also less likely to utilize mental health and medical services in comparison to White women (Ahmed & McCaw, 2010; Flicker et al., 2011). Ahmed & McCaw (2010) discuss several explanations for why ethnic minority women may not seek professional support including: racial/ethnic minority women may not be aware of the connection between trauma and mental/physical symptoms, and not realize the benefits of following up with mental health services. Lack of communication and rapport building between the patient and clinician may also be a factor (Ahmed & McCaw, 2010). Additionally, mistrust, perceived discrimination and historical racism contribute to the lack of help-seeking behaviors (Stockman et al., 2015).

Women of lower socioeconomic status and ethnic minorities experience higher rates of trauma exposure. To obtain a more comprehensive understanding of how women can heal from trauma, it is important to note there are barriers women face in relation to one's social environment and circumstance (Stockman et al., 2015). The social determinants of health are of importance due to biological, behavioral and social coping, or lack thereof, during and after a stressful event (Carter-Pokras & Baquet, 2002). Understanding social determinants of health in relation to underserved populations who experience trauma is crucial in addressing individual perceptions, help-seeking behaviors and the barriers that contribute to heightened risk of developing PTSD (Stockman et al., 2015).

## POSTTRAUMATIC STRESS DISORDER

Most individuals have been, in one way or another, affected by trauma either directly or vicariously through family, friends, or loved ones (Emerson & Hopper, 2011). Human beings, in general, are resilient and able to overcome challenges associated with potentially traumatic experiences. In the United States however, 20% (44.7 million people) of individuals develop PTSD. Though PTSD

affects about 7.7 million American adults every year (PTSD United, 2013), underserved women are disproportionately affected (Scott-Tilley et al., 2010; Roberts et al., 2011; Planty et al., 2013). One out of ten women will get PTSD at some point in their lives. This makes them twice as likely to be diagnosed as men (Scott-Tilley et al., 2010). Roberts et al. (2011) explored the risk for developing PTSD in individuals with varying ethnic and racial differences. Blacks had a higher lifetime prevalence of PTSD compared to Whites. Hispanics also had higher rates of PTSD than Whites. (Roberts et al., 2011). Furthermore, in a review of 115 studies exploring mental disorders in low and middle-income countries, over 70% found a positive association between poverty measures and mental disorders, such as PTSD (WHO, 2014).

Underserved women are not only at higher risk for experiencing traumatic events, but the majority of the events are related to sexual assault or child abuse. In the general population, between 17 and 33% of women have reported histories of sexual or physical abuse and range from 35 to 50% in mental health settings (van der Kolk, Roth, Pelcovitz, Sunday & Spinazzola, 2005). Sexual assault, more than any other event, is likely to cause PTSD (Benjet et al., 2016). If the abuse is shorter in duration or less severe, women have a greater chance of recovering more quickly. However, daily functioning may be disrupted for those who experience more severe and frequent abuse (Warshaw et al., 2013). Not only does the severity and duration of abuse affect women, but the social determinants of health, or conditions which women are born, grow, work and live have an impact on risk for and recovery from trauma (NIH, 2009). Women may become physiologically overwhelmed in one's experience, to the point where the entire human system, biologically, cognitively, emotionally and socially is affected, resulting in PTSD symptoms (van der Kolk, 2006; PTSD United, 2013; SAMHSA, 2014; Van der Kolk, 2006).

### **Symptoms of PTSD**

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), if an individual has been exposed to death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, he or she may be at risk for exhibiting a number of symptoms associated with PTSD. Exposure to traumatic events can be direct or indirect. One may witness trauma or a violent act, be repeatedly exposed to life-threatening situations, learn an event occurred to a close family member or friend, or experience indirect exposure to the details of a traumatic event (APA, 2013). Symptoms of PTSD may not show up right away. Subtle symptoms

may surface first, then more severe symptoms may emerge months after the traumatic event (PTSD United, 2013).

The DSM-V emphasizes the behavioral symptoms of PTSD, and categorizes symptoms into four groups: re-experiencing, avoidance, negative cognitions and mood, and arousal. Re-experiencing may manifest as flashbacks, nightmares, or intrusive thoughts/memories of the event that create emotional distress or physical reactivity. Avoidance refers to any stimuli that reminds one of the event (thoughts, feelings, locations, or other external reminders). Negative cognitions and mood represent a range of negative thoughts/feelings such as self-blame, guilt, negative affect, feelings of isolation, or emotional numbness. Trauma-related arousal and reactivity may include irritability or aggression, risky behavior, hypervigilance, or difficulty concentrating or sleeping (APA, 2013). Individuals may also experience dissociative symptoms related to depersonalization or de-realization. Depersonalization encompasses a sense of detachment or disconnection from one's self. De-realization is a disconnection from one's surrounding, which can include other people. Dissociation during a traumatic event may be a protective, defense mechanism, but may pose difficulties when attempting to overcome and heal from trauma and PTSD (APA, 2013).

Even though traumatic symptoms are individualized and may be different across demographics, there may be sex-differences that exist in relation to symptoms and experiences. PTSD may also manifest differently in underserved women when compared to the general population (Tolin & Foa, 2006; Galovski et al., 2014). For example, men may exhibit more external behaviors (conduct disorders and substance abuse), whereas women, in general, experience internalizing disorders more frequently, such as anxiety or depression (Tolin & Foa, 2006). Men may tend to direct anger inward, while women, generally, ruminate over guilt and self-blame (Galovski et al., 2014). Furthermore, underserved women experience an accumulation of life stressors on top of trauma including poverty, racial and gender-based discrimination, family instability and internalized stigma (Dutton et al., 2013). Underserved women who experience sexual trauma and ongoing abuse, may experience more psychiatric symptoms, feelings of shock, loss of sense of self, disbelief, confusion, terror, isolation and despair (Warshaw et al., 2013).



## TRAUMA THEORY

PTSD diagnosis and the recognition of traumatic symptoms have been helpful in understanding individual's response to trauma. Diagnosis offers an explanation for symptoms described above. It provides a framework for understanding a variety of traumatic events such as combat, injury, natural disasters, witnessing death, suffering illness, and sexual traumas (March, 1993). Prior to the knowledge and ability to diagnose women who have been victims of sexual assault or rape specifically, victims were often blamed for the event based on personal characteristics (Gilfus, 1999). Not only does the PTSD framework relieve the blame on victims, but it provides a greater understanding of one's experience in order to inform effective treatment of PTSD symptoms (Wasco, 2003).

Trauma response theory, derived from the PTSD framework, places a greater emphasis on acknowledging that the victim's distress is a result of the traumatic event itself (Wasco, 2003). Therefore, one's experience is understood through the feelings of fear, horror and threat to one's life or integrity associated with the event. For example, specific characteristics of a traumatic event such as presence of injury, risk of death or extreme violence have been shown to increase one's likelihood of developing PTSD. The experiences of underserved women who experience sexual trauma, however, are much more complicated. Focusing on the traumatic event itself, is a limited scope of what women's experiences actually involve. The emphasis on the horror of the traumatic event does not take into account the cultural, social and relational context in which underserved women experience sexual trauma (Wasco, 2003).

Another aspect of trauma response theory involves one's assumptions about the world. The theory assumes that non-traumatized individuals hold the view that the world is safe, predictable and just. After a traumatic event occurs, one's worldview is then challenged (Gilfus, 1999). Assumptions about themselves, others and the world may be disrupted or shattered. Underserved women, however, may have experienced a history of racism, oppression or repeated trauma, where the world has never been viewed as safe, predictable or just. Therefore, traumatic events experienced by underserved women may only confirm initial beliefs about themselves, others and the world (Wasco, 2003). Though the conceptualization of PTSD and trauma response theory are important for the development of treatments to facilitate healing, factors such as gender, class, ethnicity and history of victimization may not be included within existing frameworks (Gilfus, 1999). The

effects of trauma commonly accepted in the United States may not be consistent for all individuals. For this reason, it is important to understand the impact of trauma as it relates to an individual's interpretation of the event (SAMHSA, 2014).

## IMPACT OF TRAUMA AND PTSD

Whether or not an experience is deemed traumatic depends on the individual's interpretation and acuity of the event. There are many biopsychosocial factors that go into this interpretation, which may result in lasting symptoms (SAMHSA, 2014). The root of PTSD may be linked to biological factors in an individual. These factors are related to one's nervous system and neurobiology. The physiological and neurobiological responses to a traumatic event impose physical, cognitive, emotional, and social consequences on an individual (van der Kolk, 2006, Goodman & Calderon, 2012). When considering how to overcome PTSD, it is important to understand the underlying mechanisms of the body in response to a traumatic experience. The deeper layers of PTSD as it relates to biological systems and impacts on physical health are discussed below.

### **Biological Impact**

#### Physiology

The physiological response to a traumatic event is at the heart of posttraumatic stress. One's body may not be able to return to homeostasis after igniting the stress response (i.e. fight, flight, or freeze) occurring at the time of the event. During the stress response, energy is released in the body, where engaging in the fight or flight response allows this energy to be discharged. However, if one's body becomes immobile, or engaged in the freeze response, released energy becomes trapped in the body. Failure to discharge this energy contributes to a dysregulated system and presence of posttraumatic stress symptoms (van der Kolk, 2006; Goodman & Calderon, 2012).

The response to stress and trauma is regulated by the autonomic nervous system (ANS) and the hypothalamic pituitary adrenal (HPA) axis, which function without conscious control (Goodman & Calderon, 2012; McCorry, 2007). Under normal conditions, the sympathetic (SNS) and parasympathetic (PNS) nervous systems balance the body. Stress activates the SNS via the amygdala to the hypothalamus. Once the adrenal glands release epinephrine and norepinephrine, initiating the fight or flight response, the body experiences physical symptoms such as decrease in digestion, pale skin, dilated pupils, increased heart rate, respiration, blood pressure, and

perspiration. After the perceived threat has passed, the hypothalamus signals the pituitary gland to release cortisol. This returns the body to homeostasis (van der Kolk, 2006; Goodman & Calderon, 2012). In some cases, however, the PNS and SNS will be activated simultaneously. Therefore, instead of the fight or flight response, the person will freeze, and the body will be immobile, creating dysregulation of the ANS (van der Kolk, 2006; Goodman & Calderon, 2012).

If there is dysfunction among the ANS, the limbic system then becomes dysfunctional, where arousal occurs without the presence of a threat. (Goodman & Calderon, 2012). In other words, people get stuck in fight, flight or chronic shutdown (van der Kolk, 2006, van der Kolk, 2014). One's defense system is either continuously activated, or randomly activated by "triggers" (Goodman & Calderon, 2012; van der Kolk, 2014; SAMHSA, 2014). A trigger can be defined as a sensory stimulus that reminds an individual of a trauma. These triggers can be conscious, easily identified and anticipated, or they can be subtle and surprising to the individual. Examples of sensory stimuli include noises, smells, temperatures, visuals or physical sensations. (SAMHSA, 2014). Once exposed to these triggers, an individual may then have the same emotional and physiological response that occurred at the time of the traumatic experience (van der Kolk, 2006). The way in which individuals interpret a traumatic event largely depends on how it is encoded in the brain.

The physical sensations one feels in connection with emotions experienced may be conceptualized in relation to the Polyvagal Theory (Porges, 2007). This concept has been related to the vagus nerve's relationship to the autonomic nervous system (ANS). According to Porges' theory, the ANS is regulated by the vagus, a cranial nerve. This nerve starts in the medulla, exits through the brain stem, down the spine, and connects to the throat, heart, lungs, and organs such as the stomach and intestine. The vagus nerve assists in controlling the function of the lungs, bladder and bowels and the way the heart works as well (Homann, 2010). Essentially, this theory posits that the central nervous structure links to autonomic function and may be regulated neurologically (Porges, 2007). As the brain takes in messages from all parts of the body, it also communicates information out to the body (Homann, 2010). The polyvagal theory links autonomic regulation with psychological, physiological and behavioral processes (Porges, 2007). Though PTSD may be rooted in the physiological response, it also impacts either the activation or suppression of certain areas of the brain (van der Kolk, 2006; Goodman & Calderon, 2012).

## Neurobiology

Not only does the autonomic nervous system play a major role in the stress response, but the limbic system, which is in charge of the formation of memory, becomes dysregulated as a response to traumatic stress. The dysfunction resides in the formation of memory. The limbic system is made up of explicit and implicit memories. Explicit memory is mediated by the hippocampus. It consists of declarative memory that stores facts, language, descriptions, and narratives. This is where one forms a conscious understanding of meaning and sequences of events. Implicit memory is mediated by the amygdala. This is the non-declarative memory responsible for emotional and sensory information. Implicit memory allows one to unconsciously recall previously learned procedures and behaviors (van der Kolk, 1998; Goodman & Calderon, 2012). Explicit and implicit memories work together to process experiences. PTSD, however, disrupts this memory formation. Once the stress response is activated, the hippocampus is suppressed, so one cannot create an explicit (narrative) memory of the event. Since the amygdala is not suppressed, the traumatic event is stored in implicit memory (Goodman & Calderon, 2012). An overactive amygdala during a traumatic experience means an individual is taking in significant amounts of fragmented sensory information related to the trauma. Due to a decrease in medial prefrontal/anterior cingulate function, the part of the brain in charge of executive functions (logic and reasoning), and a suppressed hippocampus, individuals with PTSD have intense emotional recollections that lack any context (Goodman & Calderon, 2012).

The combination of a dysregulated nervous and limbic system, along with a decrease in prefrontal, hippocampus function and overactive amygdala may have detrimental effects on individuals with PTSD (Goodman & Calderon, 2012). Making sense of the sensations individuals are experiencing in one's body may not be possible (Goodman & Calderon, 2012; van der Kolk, 2014). In turn, the sensations in one's body may be associated with the fear response, contributing to a disrupted sense of safety in one's own body (van der Kolk, 2014). The nervous system and brain are affected by stressful stimuli, and biologically interpret potentially traumatic experiences subconsciously. Therefore, the initial response to stress is out of one's conscious control (Goodman & Calderon, 2012).

PTSD is characterized by failure to physiologically adapt to stressors or reminders of stressors. This is also related to allostatic load, which refers to the detrimental effects on the body when

adapting to adverse and repeated psychosocial and physical stressors. Allostasis is defined as one's ability to maintain physiological stability through environmental changes (Danese & McEwen, 2012). That being said, prolonged stress and lack of regulation can affect the body's chemistry, structure and function due to excess neural, endocrine and immune stress. Individuals who experience traumatic stress over prolonged periods of time are at risk for experiencing allostatic overload. This lack of adaptation may result in the long-term activation of the stress response, ultimately influencing the body's immune activity resulting in negative physical health consequences (Pacella, Hruska & Delahanty, 2013).

### Physical Health Consequences

A dysregulated nervous and limbic system may lead to allostatic overload, compromising one's immune activity and leading to physical health consequences (Pacella, et al., 2013). Physical consequences may include chronic pain, (Outcalt et al., 2014; Shepherd et al., 2007) particularly pelvic pain in women (Koss & Heslet, 2009), headaches and fibromyalgia (Peres & Goncalves, 2009). Women may also experience premenstrual problems (Koss & Heslet, 2009). Other symptoms include irregular bowel movements or irritable bowel syndrome (Mayer, Naliboff, Chang, & Coutinho, 2001), or other physical symptoms that have no origin (van der Kolk, 2014). Woods et al. (2008) found a significant positive relationship between PTSD symptom severity in women experiencing IPV and physical health symptoms related to neuromuscular (i.e. back pain, headaches, fainting and seizures), stress (i.e. hypertension, loss of appetite, abdominal pain and increased susceptibility to viral and bacterial infections), sleep and gynecologic symptoms. Physical symptoms reported most frequently, however, were vague or nonspecific (Woods et al., 2008). Physical symptoms that continue to surface for individuals, but have no origin, may have a stronger relation to the psychological impact of trauma. Highlighted below are the psychosomatic consequences of PTSD (van der Kolk, 2006; Woods et al., 2008; van der Kolk, 2014).

## **Psychological Impact**

### Psychosomatic Consequences

The manifestation of PTSD varies among individuals. For example, one may exhibit hypervigilance and emotion dysregulation, and another might have flat affect and be emotionally numb (van der Kolk, 2014). In the latter case, individuals may attempt to suppress symptoms associated with emotions in relation to the event. Suppressing these symptoms may then manifest

themselves as physical sensations and ailments (van der Kolk, 2014). Though individuals are pushing emotions, thoughts and feelings from the traumatic experience from their awareness, sensations associated with the trauma still surface (Emerson & Hopper, 2011). Van der Kolk (2014) relates this to, “crushing feelings in your chest, agonizing tension in your shoulders, and burning pain in your abdomen, accompanied by the conviction that you are utterly helpless to do anything about it” (Emerson & Hopper, 2011, p.xix).

Women who have experienced sexual trauma are more prone to developing somatic symptoms. Though they may be experiencing headaches, gynecologic problems, fatigue and chronic pain, there is no explanation for the cause of these symptoms (Stein, Lang, Laffaye, Lenox & Dresselhaus, 2004). Stein et al. (2004) provide evidence for the link between traumatic experiences and somatic symptoms in women. From a sample of 219 women, ninety-seven (43.9%) reported past sexual assault experience. Physical symptom complaints were significantly higher in women who had experienced sexual assault compared to those who did not. These ailments were related to severe headache, chest pain and overwhelming fatigue. Not only were there higher levels of somatization in sexually assaulted women, but also anxiety in relation to one’s perceived health (Stein et al., 2004). The literature provides evidence for the notion that emotional consequences of PTSD can be disguised as physical ailments (Stein et al., 2004; Emerson & Hopper, 2011; van der Kolk, 2014). That being said, it is important to understand trauma’s impact on one’s cognition and emotions.

### Cognition & Emotion

Characteristics of a traumatic event as it relates to one’s physiology, neurobiology, and physical symptoms have a way of integrating into one’s cognitive experience of the traumatic event. Physiological arousal that occurs when an individual is unknowingly “triggered” by sensory impressions or memories associated with sensory details of the traumatic event, contribute to this cognitive interpretation. Individuals with PTSD may experience various cognitive interpretations of one’s reality. These may include feeling as though one has been frozen in time, a continued feeling of anxiety, perception there is worse to come in the future, and a number of negative perceptions, or appraisals (Ehlers & Clark, 2000).

Due to the fragmented, sensory-based way memories are encoded during a traumatic event, an individual may re-experience flashbacks of one's traumatic experience. During these times, it may seem as though this traumatic reminder will never end. One may fail to see these flashbacks do not have negative implications for the future (Ehlers & Clark, 2000; van der Kolk, 2006). Not only do these fragmented memories impact one's perception of time, but also affect one's emotional expression and behaviors related to dealing with them (Ehlers & Clark, 2000).

Re-occurrence of intrusive symptoms may initiate emotion dysregulation. Depending on the characteristics of the trauma, individuals may experience a range of cognitive and emotional appraisals. These may be related to perceptions associated with variables such as, the simple fact the trauma happened, that the trauma happened *to* the individual, behaviors or emotions experienced during the trauma, initial PTSD symptoms, emotional numbing, flashbacks or intrusive symptoms, other individuals' reactions after the trauma, and physical consequences. One's perceptions related to these variables may elicit negative appraisals. Examples of appraisals may be that nowhere is safe, that the individual is a victim, the individual may feel deserving of bad things that occur, feeling as though one's personality has changed, feeling dead inside, perception one will never move past the trauma, and perception one is alone and does not have support from others (Ehlers & Clark, 2000).

Consequently, the nature of one's emotional responses may be affected by these perceptions and negative, maladaptive appraisals. For example, perceived danger may elicit fear. Feeling violated or that the event was unjust may produce anger. Feeling responsible for the traumatic event or outcome may result in guilt. Violations of internal morals may elicit shame, and perceived loss may result in sadness (Ehlers & Clark, 2000).

The combination of maladaptive cognitions and emotions may motivate individuals to engage in behaviors that attempt to control physiological, physical and emotional symptoms. Behaviors may include thought suppression, engaging in precautions to minimize or avoid further events, or ruminating about trauma and its consequences (Ehlers & Clark, 2000). Ehlers & Clark (2000) suggest these maladaptive behaviors maintain PTSD diagnosis by failing to reduce symptoms or even contributing to them, ultimately preventing change in the nature of the memory of one's trauma.

Sexually traumatized individuals may be trapped in time, with no perception of a past, present or future. Constant reminders of the trauma may lead to a development of overgeneralized fear, negative perceptions about oneself, and a tendency to engage in maladaptive behaviors, which may only worsen symptoms (Ehlers & Clark, 2000). The cognitive and emotional impacts of trauma create chaos in the human system, which transmits to one's social context. The social impact of PTSD affects one's self-concept, interpersonal relationships and worldview (van der Kolk, 2006; Emerson & Hopper, 2011; van der Kolk, 2014).

## **Social Impact**

### Self-Concept

Trauma has the potential to significantly impact an individual's sense of safety, trust and self-worth, contributing to a loss of sense of self (van der Kolk et al., 2005). One's self-concept may be gravely affected by sexual trauma. Victims of sexual trauma often are exposed to harm, violence, maltreatment of one's body, and an experience of powerlessness. Intentional threats and degradation may leave victims feeling unworthy, vulnerable and inferior. Violation of one's body may induce feelings of self-disgust. Additionally, doubtful messages from society may contribute to self-blame, insecurity and self-doubt. Consequently, individuals are silenced, leading to internalized self-blame and maladaptive beliefs about one's self-concept (Keshet & Gilboa-Schechtman, 2015). Ultimately, victims of sexual trauma tend to internally perceive themselves as inadequate or unable to achieve goals in life and this has detrimental effects on many aspects life, including individual drives, motivations, and purpose in life (Ehlers & Clark, 2000). The symptoms related to these beliefs translate into emotional numbing, withdraw, and avoidance which begin to affect one's interpersonal relationships (Monson, Taft & Fredman, 2009; Lambert, Engh, Hasbun & Holzer, 2012).

### Interpersonal Relationships

Relationship satisfaction (Monson, et al., 2009) and quality have been shown to be lower among individuals with PTSD (Lambert et al., 2012; Meis, Erbes, Polusny & Compton, 2010). In a review of studies assessing PTSD and relationships, increased symptoms of PTSD were associated with a decrease in relationship quality in twenty-one out of twenty-two of the studies (Lambert et al., 2012) The literature suggests relationship issues may come from an inability to relate to others,



which can result in a *perception* that there are more problems in the relationship (Goff & Smith, 2005). Research trends provide evidence that the severity of PTSD symptoms in one partner may also be related to the psychological distress, such as anxiety, stress or depression, in the other (Goff & Smith, 2005). In other words, the more severe PTSD symptoms are in a trauma victim, the more one's partner will experience distress. Lack of attunement and an increase in avoidance and emotional numbing may relate to this imbalance in intimate relationships (Lambert et al., 2012).

In a study by Cannop and Petrak (2004), participants reported less sexual contact between partners after a sexual assault. Many participants attributed this to perceptions of the male partner. Specifically, men whose partner had been sexually assaulted reported anxiety around sexually transmitted infections, difficulties with erectile problems, premature ejaculation and feelings of disgust at the thought of one's partner with another man. Additionally, women felt one's partner had lost respect after disclosing that she had been sexually assaulted. This perspective was described in the context of the socio-cultural idea that women may seem "damaged" as a result of being sexually assaulted. This study suggests that not only does the victim of sexual assault experience psychosexual difficulties with function and intimacy, but it also has a significant effect on one's partner (Cannop & Petrak, 2004).

Women who have experienced sexual trauma may have greater difficulties in sexual functioning and intimacy (Cannop & Petrak, 2004). In relation to post-assault and sexual functioning, approximately 58.6% of survivors report sexual dysfunction, and 71% of these women felt this was because of one's sexual assault. This may be a result of overgeneralized anxiety and fear associated with sexual victimization and attributing this to other sexual situations. Martinson et al. (2013) found that overgeneralized attributions may result in discomfort with closeness in a relationship, less confidence or trust in the dependability of a partner and fear of abandonment in comparison to women who did not have sexual trauma histories. Additionally, sexually victimized women may have difficulty with romantic intimacy and poor emotional communication, leading to difficulties in emotional closeness (Martinson et al., 2013).

Specific symptoms of PTSD may contribute to difficulties in interpersonal relationships. Women who experience blunted emotions may lack the ability to relate, empathize or attune to others. Furthermore, intimacy and relationship issues arise from perceptions of the victim's partner, along

with fear and anxiety associated with one's sexual victimization (Martinson et al., 2013). Not only do victims overgeneralize this fear and lack of trust in relationships (Cannop & Petrak, 2004; Monson, et al., 2009; Lambert et al., 2012; Martinson et al., 2013), but also in relation to one's view of the world (Ehlers & Clark, 2000).

### World-View

Triggers linked to strong physical sensations and emotional arousal may not have *any* contextual memory associated with them. This may lead individuals to overgeneralize fear and associate this fear to many situations in the present and future (Ehlers & Clark, 2000). Dissociation may be a defensive strategy for survivors to minimize overwhelming thoughts, emotions or sensations associated with the trauma. Interpersonal trauma and sexual assault in particular have been linked to a higher prevalence of dissociative symptoms. Prior to the trauma, survivors may have held the view that the world is "good" and meaningful. This mind-set allows individuals to interpret incoming information as safe and may have a sense of purpose. This worldview is threatened by traumatic experiences, as it is contradicting one's initial cognitive framework (Lilly, 2011). This contradiction may seem confusing, chaotic, and threatening (Lilly, 2011), where individuals may then create negative perceptions, viewing the external world as a dangerous place (Ehlers & Clark, 2000).

Wasco (2003) contradicts the assumption that *most* non-traumatized individuals hold a view that the world is safe and just. Sexual trauma may not always shatter one's assumptions about the world, but rather *confirm* them, especially in the lives of underserved women. Underserved women may have experienced racial or gender discrimination, or grew up in a poor, working class or immigrant family. Furthermore, individuals may have been victims of child sexual abuse, or exposed to family or intimate partner violence. One's cognitive framework may be that the world is unjust and not safe. One's home may not even feel safe. It may be important to consider the unique experiences of underserved women. The interrelation of gender, class, ethnicity and history of victimization may require special attention and considerations to keep in mind when exploring ways to restore one's sense of self and relationship with others and the world (Wasco, 2003).

## TREATMENT FOR PTSD

Not only do PTSD symptoms internally affect the biology, physiology and relationship with one's self and view of the world in an individual, but outwardly affect one's relationships and family life (Goff & Smith, 2005; Taft et al., 2007; Monson, et al., 2009; Sayers et al., 2009; Lambert et al., 2012; van der Kolk, 2014). Traumatic experiences and individuals are diverse (PTSD United, 2013). Levels of traumatic exposure in relation to duration and severity, along with individual differences and the complex impact of trauma, may make identifying an appropriate treatment for PTSD a complicated task (Khusid & Vythilingam, 2016).

### **Conventional Treatments**

PTSD symptoms are a result of a decrease in prefrontal cortex activation and an overactive amygdala, which leads to feelings of fear, hyperarousal, lack of impulse control, re-experiencing of intrusive negative thoughts and emotions, as well as painful memories (Khusid & Vythilingam, 2016). Conventional treatments such as psychotherapy (Bradley et al., 2005), cognitive behavioral therapy (CBT) and pharmacotherapy have been shown to be efficacious in reducing symptoms of PTSD (Johnson et al., 2011).

### Psychotherapy Therapy

There are many different types of therapies that incorporate psychotherapy, or verbal/talk therapy, including nontrauma-focused and trauma-focused approaches (U.S. Department of Veterans Affairs, 2017; Frost, Laska & Wampold, 2014; Diehle, Schmitt, Daams, Boer, & Lindauer, 2014). Most approaches in psychotherapy attempt to reduce trauma-related cognitions in victims suffering from PTSD (Diehle, et al., 2014).

Nontrauma-focused therapies, such as present-centered therapy (PCT), focus on the present, changing present maladaptive patterns or behaviors, incorporate psychoeducation, and utilize problem-solving strategies (Frost, et al., 2014). In contrast, a trauma-focused approach targets the memory of the traumatic event and/or its meaning. Specific techniques intend to assist individuals in processing one's experience through visualization, talking or thinking about the memories associated with the event. Approaching traumatic memories in this way may assist victims in regaining control by facing negative feelings. It may also help individuals restructure one's memories in a way that is less fragmented, and ultimately create meaning in one's experience.

Examples of different trauma-focused techniques include prolonged exposure (PE), cognitive processing therapy (CPT), eye-movement desensitization and reprocessing (EMDR), narrative exposure therapy (NET) and cognitive behavioral therapy (CBT) (U.S. Department of Veterans Affairs, 2017).

Due to the breadth of treatments, Diehle et al. (2014) conducted a meta-analysis to determine which method of psychotherapy, either nontrauma-focused vs. trauma-focused, is most effective in reducing trauma-related cognitions in PTSD. Data was analyzed from fourteen studies with over 650 participants. Results from the meta-analysis indicated trauma-focused interventions, particularly CBT, had significantly large effects in reducing trauma-related cognitions in comparison to nontrauma-focused interventions and control conditions (Diehle et al., 2014). CBT is described in greater detail below.

### Cognitive-Behavioral Therapy

Cognitive Behavioral Therapy (CBT) focuses on processing traumatic memories cognitively by attempting to change one's perspective and incorporates behavioral components by focusing on developing skills to practice new thoughts (Johnson et al., 2011). One approach is through prolonged-exposure, which involves recalling and repeating the traumatic event to desensitize the individual to the emotional response, such as fear and anxiety, associated with the event. (Warshaw et al., 2013). By engaging in repeated exposure and applying cognitive skills to reframe the memories in a more realistic context, patients may be able to decrease the stress response when memories resurface (Kolzowska et al., 2015). However, exposure to traumatic memories has the ability to quickly activate the SNS, resulting in increased arousal (Kolzowska et al., 2015).

Johnson et al. (2011) implemented and assessed the effectiveness of a program called Helping to Overcome PTSD through Empowerment (HOPE), which is a shelter-based CBT treatment. HOPE attempts to reduce symptoms of PTSD and aid in recovery through establishing safety, remembrance and mourning, and reconnection. Johnson et al. (2011) found that participants in the HOPE condition reported less emotional numbing symptoms but did not find any significant differences in symptoms associated with re-experiencing, avoidance, or arousal. A lack of differences in these symptoms may be due to victims' arousal response amplifying during treatment (Kolzowska et al., 2015). CBT interventions such as HOPE might be helpful in reducing

emotional numbing symptoms, but modifications to reduce re-experiencing, avoidance and arousal may be required to improve HOPE's impact on PTSD (Johnson et al., 2011). Other interventions, such as pharmacotherapy, have been implemented to address this issue as well (Seedat et al., 2005).

### Pharmacotherapy

PTSD symptoms can be managed through pharmacotherapy as a short-term treatment. Antidepressants, especially selective serotonin reuptake inhibitors (SSRI's), are recommended as the first choice for PTSD. SSRI's target symptoms such as re-experiencing, avoidant/numbing, and hyperarousal as well as disorders that are comorbid with PTSD (depression, panic disorder and generalized anxiety disorder). Although medications are effective as a quick approach to treatment, few studies have examined the safety of long-term use (Seedat et al., 2005).

CBT and pharmacotherapy are beneficial in reducing symptoms of PTSD. CBT targets areas of PTSD that creates deficits in one's cognition and symptoms related to emotional numbing (Johnson et al., 2011). Pharmacotherapy is efficacious in managing hyperarousal symptoms short-term. However, individuals may not be at a point in the healing process where exposure to traumatic memories is possible. Exposure may result in the re-traumatization of an individual, and the risk of drop-out is much higher when participants experience high levels of distress, consequently worsening symptoms (Hinton, Hofman, Rivera, Otto & Pollack, 2011). Due to the psychobiological interconnection in resolving traumatic symptoms, treatments that involve managing the mind and body simultaneously may be important to explore (Kozłowska et al., 2015).

### **Mind-Body Modalities**

Due to the complex and interwoven relationship between the response to stress and health disparities among underserved women, researchers have been developing a deeper, more thorough investigation of holistic healing modalities (Shapiro et al., 2006; van der Kolk, 2006; Jha et al., 2010; Smith et al., 2011; Vujanovic et al., 2011; Niles et al., 2012). The research literature provides evidence for the efficacy of mind-body based therapies in the reduction of PTSD symptoms such as mindfulness-based interventions (Shapiro et al., 2006; Jha et al., 2010; Smith et al., 2011; Vujanovic et al., 2011; Niles et al., 2012; Dutton et al., 2013; Sipe & Eisendrath, 2012; Khusid &

Vythilingam, 2016), somatic experiencing (Payne et al., 2015), QiGong and T'ai Chi (Grodin et al., 2008), dance (Harris, 2007; Homann, 2010) and yoga (Price et al., 2017).

Somatic experiencing is a form of trauma therapy that orients an individual's attention to the body. This form of therapy encompasses embodiment, which refers to how one lives in and experiences the world through the body. There are three levels of attention that are emphasized: interoceptive, kinesthetic and proprioceptive. Interoceptive awareness refers to sensations experienced within the body, such as temperature, pain, tingling sensations, etc. These sensations may be linked to emotions. However, emotions and emotionally charged memories are not the initial focus. Kinesthetic awareness emphasizes learning through feeling the body's motions and movement patterns. Proprioceptive awareness focuses on body motions and movement patterns in space. Directing attention to 'felt' sensations, first, may be an avenue in eventually approaching memories indirectly and gradually. Establishing an awareness of one's 'felt' sensations is known as embodiment (Payne et al., 2015).

Individuals who practice awareness of somatic experiencing, may begin to learn about one's self through bodily experiences and develop embodiment (Payne et al., 2015). Studies that have used concepts from somatic experiencing therapy, such as interoception, kinesthetic, and proprioception, have shown to improve PTSD symptoms such as intrusive memories, avoidance and increased emotional arousal (Kim, Schneider, Kravitz, Mermier & Burge, 2013). More specifically, QiGong and T'ai Chi have been shown to be beneficial practices before and after victims of trauma attend psychotherapy sessions. Victims initially experienced muscle tension, constricted breathing and reduced body awareness and sensation. Ten to fifteen minutes of qigong or tai chi were shown to facilitate psychotherapy sessions, reduce hypervigilance and psychosomatic complaints, and increase introspection during psychotherapy (Grodin et al., 2008). Not only is proprioception practiced in QiGong and T'ai Chi, but dance has been used as a form of body-based therapy and has been shown to facilitate the biopsychosocial connection (Homann, 2010).

Homann (2010) discusses the benefits of dance therapy as it relates to self-awareness, emotional regulation, perceptual experience, and movement expression. Much like somatic experiencing, QiGong and T'ai Chi, dance therapy focuses on the body's role in the perceptual process. The

therapist facilitates the individual's sense of "feeling felt" due the human reflective capacity. Homann (2010) relates this to the mirror neuron system. The mirror neuron system helps one to adjust responses based on what is sensed from the minds of those to whom we are in contact. A component of dance therapy is to practice proprioception. Individuals may experience severe anxiety when delving into sensations experienced in the body, especially trauma victims. However, moving together may create a relational experience, where the therapist can create a safe therapeutic environment. For example, when the therapist communicates a calm, grounded state through respiration, heart rate, facial expression and movement, the trauma victim's mirror neuron system may be tracking this information and sending signals to the limbic system. Therefore, the victim's response mirrors the therapist's during this interaction (Homann, 2010). The mirror neuron system is only one factor within the underlying mechanisms related to therapeutic aspects of dance therapy, which is beyond the discussion of this paper. Dance is one of the many mind-body based therapies which incorporates the therapeutic effects of somatic experiencing, such as gaining awareness of felt sensations, and "feeling felt" by another individual (Homann, 2010).

Collectively, somatic experiencing and modalities such as QiGong, T'ai Chi and dance provide evidence that individuals who are victims of trauma may be able to create a sense of self as it relates to one's body and felt sensations (Grodin et al., 2008; Homann, 2010; Kim et al., 2013; Payne et al., 2015). Practicing somatic experiencing within various mind-body based modalities, may provide an opportunity to distinguish the difference between sensations and emotions. By gaining this awareness, one may learn that it is safe to have feelings and sensations, and to explore one's inner experience instead of being afraid of it (van der Kolk, 2006). Van der Kolk (2006) notes that by noticing one's inner experience, this information may eventually be processed in a communicative way that the individual can understand. Furthermore, by noticing the continual shifts in one's body, the individual may learn he or she possesses greater control over one's physiological states. Ultimately, individuals may eventually experience emotions and memories from the past in a physical state, with control (van der Kolk, 2006).

Victims of trauma face many challenges such as accepting what happened and learning to gain control of internal sensations and emotions (van der Kolk, 2014). Van der Kolk (2014) suggests that sensing, naming and identifying what is happening in one's experience is the first step in healing from trauma. There is a bi-directional dialogue between the body and mind, and body-

based approaches may be a segue into eventually mastering trauma's impact on the mind (van der Kolk, 2014). Yoga is deemed as another mind-body modality that facilitates the healing process in victims of trauma, keeping in mind, the challenges described above (Soller et al., 2011; Staples et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017).

Yoga has not only been efficacious in reversing some of the deficits created by trauma exposure and PTSD (Stoller et al., 2011; Staples et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017), but may be composed of many elements that are both therapeutic (Shapiro et al. 2006; Jerath R., Edry, Barnes, & Jerath, V., 2006; Vujanovic et al., 2011; Sipe & Eisendrath, 2012; Descilo et al., 2016) and flexible enough to be adapted for underserved women and mitigate barriers to accessing quality treatment (Dutton et al., 2013). Some of the common constructs used in yoga are explored below.

## COMPONENTS OF YOGA & RELATIONSHIP TO PTSD

Yoga may be conceptualized in many different ways in the United States. Yoga has been seen as mind-body fitness where a range of muscular activity is paired with mindful awareness of one's breath or body. Another interpretation is related to the therapeutic effects of the yoga practice such as assisting in the treatment of physical and mental health conditions. For example, yoga has been applied to populations who have experienced physical injury or pain, as well as psychological or emotional ailments such as depression, anxiety (Javnbakht, Hejazi Kenari & Ghasemi, 2009) or PTSD (Price et al., 2017). Traditionally, yoga may be recognized as a system of healing, which is over 3,000 years old, and is comprised of four principles (Woodyard, 2011). The first principle relates to the word "yoga" itself. "Yoga" is derived from the Sanskrit root "yuj", which means to yoke, or to join, unite, and direct one's attention. Therefore, the principle views the human body as a holistic entity: denoting all elements of the human capacity as interrelated and inseparable. The second principle acknowledges individuality, where each individual's needs and experiences are unique and should be tailored to. Third, yoga strives to be self-empowering, where one can obtain a greater sense of autonomy. The goal of health and healing comes from within, instead of from an external source. Finally, the fourth principle is the importance of an individual's state of mind. Yoga encourages a positive mind-state which may contribute to a more rapid rate of healing (Woodyard, 2011).



## **Philosophy**

Many individuals in the United States may recognize yoga as a mind-body modality that focuses on physical postures and incorporates breath and meditation. However, the philosophy behind yoga is comprised of much more. Yoga also incorporates an active intention of striving for health and healing through other components such as lifestyle, diet changes, visualization, and the use of sound, to name a few. There are also ethical principles for finding meaning and purpose in life. Ethical principles may focus on one's own capacity to heal, along with an acknowledgement of spirituality. Yoga postures and movement, specifically, unify the physical body, breath and concentration to balance the body on an energetic level. It may be through the integration of these components where blockages in the energy channels can be released (Woodyard, 2011).

Blockages may be due to negative unconscious patterns, or habits, belief systems, physical or emotional injuries, lack of attention, or life stressors and significant traumas (Judith, 2004). Individuals may develop maladaptive coping strategy patterns anchored in the body. Coping patterns may be associated with withdraw and avoidance, attempting to decrease the energy (Judith, 2004). In contrast, patterns may be related to increasing one's energy to fight the stress. For example, a trauma victim who activates the freeze response at the time of the event remains immobilized, trapping all the released energy in the body. Consequently, the victim experiences a dysregulated autonomic nervous system associated with PTSD. The victim may continue to have re-experiencing symptoms where one's emotions, physiology, and body mimic a response that occurred at the time of the traumatic event. These frequent defense strategies may result in holding patterns, restricting the free flow of energy. Holding patterns may be referred to as chronic tension. This chronic tension affects the entire human system: posture, metabolism, breath, emotional state, perception, belief system, and interpretations. Since the entire system is affected, the patterns may then manifest themselves in all aspects of daily life (Judith, 2004).

Repeated trauma, especially in relation to sexual trauma, may be associated with a continued freeze response, where frozen energy becomes built up. There may be no safe place to discharge and release the frozen energy, resulting in un-natural or rigid mobility. Yoga postures combined with movement, breath, and concentration, may therefore be a method to restore natural mobility, ultimately discharging frozen energy (Judith, 2004). In order to gain a deeper understanding of the

primary elements in a yoga practice, mindfulness meditation, breath and physical postures/movement are described below.

### **Mindfulness Meditation**

Mindfulness is a construct related to focusing one's attention on the present experience without any judgment (Niles et al., 2012). Thoughts about the past and future may drift in and out of awareness but are to be recognized without judgment. As thoughts come and go, the individual must always bring attention back to the breath or bodily sensation. The goal is to be able to focus on mental events, such as thoughts and emotions that have previously been avoided. It is not to alter thought content, but to change one's relationship to the thoughts and feelings, and one's perception about them. It is as though thoughts and feelings are events rather than a mirror image of one's self (Sipe & Eisendrath). If one is focused on the present, worries about the future and regrets of the past may be released (Sipe & Eisendrath, 2012).

Regular mindfulness trains the mind to focus on the present and may heighten a person's ability to deal with and accept emotions and feelings as they come up (Vujanovic et al., 2011). This would mean confronting the feelings, people, activities, or places that the trauma may be triggering. Shapiro et al. (2006) suggests attention is critical to the healing process, and that mindfulness can result in the ability to enhance three skills: the ability to attend for long periods of time to one facet, the ability to shift focus of attention between objects or mental sets at will, and the ability to inhibit secondary processing of thoughts, feelings, and sensations. Though there are many benefits to mindfulness in relation to gaining skills and abilities, studies are explored showing visible effects on and connections with the brain (Holzel et al., 2011; Jha et al., 2010).

Neuroimaging studies have been conducted in order to find out how mindfulness impacts the biology of the brain. A study by Holzel et al. (2011) found increases in gray matter in participants after an 8-week Mindfulness Based Stress Reduction (MBSR) program. Changes were seen in regions of the brain involving learning and memory, emotion regulation, self-referential, and perspective (Holzel et al., 2011). Mindfulness-based interventions that target specific factors related to the nervous system have shown to be beneficial in addressing the neural pathology and complexity of PTSD (Khusid & Vythilingam, 2016).

While practicing mindfulness, the stress response is suppressed, which reduces physiological stress activity (Vujanovic et al., 2011). Many PTSD symptoms are due to decreased prefrontal cortex activation and an overactive amygdala. Mindfulness induces the opposite of this. Based on neuroimaging findings, mindfulness meditation activates the prefrontal cortex and reduces amygdala activity, leading to improved emotion regulation and impulse control (Khusid & Vythilingam, 2016). If the prefrontal cortex is controlling and filtering negative emotions created by the amygdala, the body is no longer perceiving thoughts as a threat, therefore no longer activating the stress response (Khusid & Vythilingam, 2016). Mindfulness provides the skills to acknowledge unwanted feelings without judgment, and the ability to approach painful thoughts and feelings rather than avoiding or emotionally reacting to them (Niles et al., 2012).

### **Breath**

Breathing is connected to autonomic function. This is important to note, due to individual's ability to consciously control breathing patterns. Breathing patterns can act as a messenger to the brain, through the PNS and SNS, relaying information as to how one should perceive, interpret, and respond to a potentially stressful situation (Jerath et al., 2006). A conscious manipulation of breath helps to increase parasympathetic activity, resulting in decreased heart rate and blood pressure. Conscious breath control can take many forms. For example, it varies from single nostril breathing, double nostril, to belly breathing, either fast or slow. Different forms will elicit different responses on the nervous system (Jerath et al., 2006)

Jerath et al. (2006) discusses benefits of practicing slow breathing with brief breath retention. Slow, rhythmic breathing enhances parasympathetic activation and has a tendency of improving or balancing the autonomic nervous system. Long-term practice of this type of breath has shown improvements in overall autonomic function, increase in parasympathetic activity, and a decrease in sympathetic dominance. The benefits of conscious control of slow, rhythmic breathing have been beneficial in the clinical application in treatment for psychological disorders such as PTSD. Previously mentioned, PTSD elicits a dysregulated autonomic system, where conscious breath practice can counter this response (Jerath et al., 2006).

## **Physical Postures and Movement**

In yoga, attention may be focused on the breath or bodily sensations. By focusing on one particular facet, one may be able to pay attention on purpose and focus on the present moment. It may be used as a method for practicing mindfulness (Sipe & Eisendrath, 2012). Movement and body-based practices such as physical postures, known as *asanas* in yoga, are also largely involved in individuals' perceptual processes and the development of embodiment (Homann, 2010). One's state of arousal or rest may be acknowledged and possibly controlled by gaining greater body awareness. Homann (2010) explored the relationship of the body's role of these perceptual processes in relation to Steven Porges' Polyvagal Theory and the functioning of the brain. From this perspective, the body has the ability to create the perception of "feeling felt", contributing to self-reflection, emotional organization or regulation. Movement and body-based components of yoga may accomplish these benefits by their influence on arousal and rest and emotional regulation (Homann, 2010).

Physical postures and movement emphasize and encourage proprioception. Consciously gaining awareness by tracking sensations, focusing on the rhythm of the breath, or guiding the awareness through the body, one body part at a time, may establish a continued awareness rooted in the present moment (Homann, 2010; Sipe & Eisendrath, 2012). Victims of trauma and PTSD continue to re-live one's traumatic experience through the body. The mind may be intruded with fragmented images, but the body continues to experience increases in heart rate, respiration and perspiration (Harris, 2000). If victims begin to gain greater awareness of the sensations in one's body, and notice how the breath is under conscious control, and *feel* how one has control over heart rate and respiration, a sense of safety is communicated to the brain, and bi-directionally, back to the body (Payne et al., 2015). Harris (2000) acknowledges that the problem victims of trauma experience is related to failure to analyze what is happening when one is re-experiencing physical sensations of a past trauma. Physical sensations elicit intense emotions and one is not able to regulate them. These uncontrollable states may cause individuals to dissociate. However, by practicing physical postures and movement in yoga, one practices proprioception, which may help individuals stay in one's body to understand the meaning attached to bodily sensations. Eventually, one may begin to control the messages sent to and from the brain and ANS (Harris, 2007).

Regaining this sense of agency, or control over one's own actions and choices in the world, is important in healing from trauma. Additionally, knowing *what* is felt may be the first step in discovering *why* one feels that way (van der Kolk, 2014). Body-based practices provide a method for connecting with sensory information that may have been blocked or suppressed after a traumatic experience. Allowing sensory information to surface through mindful awareness may then allow individuals to control one's response to sensations. For example, gaining subjective awareness of initiating, executing and controlling one's own body and movements, may foster one's sense of agency (van der Kolk, 2014). Furthermore, the breath may be consciously controlled and have a direct effect on one's ANS. Therefore, victims of trauma may control the messages sent via the vagus nerve, influencing one's interpretation of experience (Payne et al., 2015). The components of yoga, mindfulness meditation, breath, physical postures and movement allow an individual to connect with inner sensations and feel in charge of one's body, feelings and self (van der Kolk, 2014; Descilo et al., 2016).

## YOGA AS TREATMENT FOR PTSD

Yoga in particular has been shown to reduce anxiety, depression, dissociative symptoms, hyperarousal, and decrease PTSD symptom severity to the point where individuals no longer meet diagnostic criteria. Positive results have been reported in veterans and in women with chronic, treatment-resistant PTSD (Stoller et al., 2011; Staples et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017). Women have also reported increased awareness, self-acceptance, self-empowerment, and decreased stress after completing a yoga intervention (Dutton et al., 2013). There is a significant amount of research that exists that provides support for yoga as an efficacious intervention for PTSD (Stoller et al., 2011; Staples et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017). Additionally, there are a growing number of research studies examining various populations, including women who have experienced sexual trauma (Dutton et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017). Though yoga interventions may incorporate many of the same components, it is important to note there are various yoga protocols found in the research literature. The diversity in yoga interventions and their effects on victims with PTSD are briefly described below (Stoller et al., 2011; Staples et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017).

Stoller et al. (2011) explored the benefits of a sensory-enhanced hatha yoga program in combat veterans, as it relates to the normalization of sensory processing and effects on combat stress, including anxiety. No differences were found in relation to the normalization of sensory processing. However, individuals assigned to the yoga intervention experienced a decrease in levels of anxiety (Stoller et al., 2011). Staples et al. (2013) tested the efficacy of Krishnamachara Healing and Yoga method in veterans. This particular study evaluated the feasibility and effectiveness of a yoga intervention in veterans with PTSD. Results indicated there were significant reductions in hyperarousal symptoms and reduced daytime dysfunction related to poor sleep (Staples et al., 2013).

van der Kolk et al. (2014), Rhodes, Spinazzola and van der Kolk (2016), and Price et al. (2017) completed a series of studies examining whether Trauma-Sensitive Yoga from the Trauma Center's protocol reduced symptoms of PTSD in women with chronic, treatment-resistant PTSD. Initially, van der Kolk (2014) assessed whether ten weeks of Trauma-Sensitive Yoga reduced symptoms of PTSD compared to a control group. As a follow-up study, Rhodes, Spinazzola & van der Kolk (2016) examined whether treatment group status in van der Kolk's (2014) study and frequency of yoga practice after the study lead to greater changes in PTSD diagnosis and experience of symptoms. Additionally, Price et al. (2017) built upon van der Kolk's (2014) study to see if an extended yoga treatment would lead to greater symptom reduction. Collectively, the majority of participants assigned to the TC-TSY no longer met criteria for PTSD compared to the control group. Furthermore, Rhodes, Spinazzola and van der Kolk (2017) and Price et al. (2017) concluded that longer, more frequent yoga practice leads to positive benefits for women with chronic, resistant PTSD (Price et al., 2017).

Mindfulness-Based Stress Reduction (MBSR) as a basis for treatment for PTSD has been studied in populations of women who are survivors of intimate partner violence (Dutton et al., 2013). Dutton et al. (2013) assessed the feasibility of a mindfulness-based intervention that incorporated yoga as a mindfulness practice in an underserved population of women with PTSD. MBSR does not require a mental health professional or a specific setting to be effective. This makes the treatment more accessible and potentially less stigmatized (Dutton et al., 2013). Overall, seventy percent of women (out of 53 women) attended five or more sessions, concluding that participation in MBSR seems to be a feasible intervention for low-income women from ethnic minority groups

(Dutton et al., 2013). Women reported positive feedback for acceptability of MBSR. Increased awareness, self-acceptance, self-empowerment, non-reactivity, self-care, and decreased distress were positive benefits frequently reported. For a population that is unlikely to seek or receive traditional treatment, yoga interventions, such as MBSR are feasible and accepted in a group of underserved women with trauma-related symptoms (Dutton et al., 2013).

### **Implications for Yoga Treatment in Underserved Women**

Kozłowska et al. (2015) discuss important aspects to consider when approaching treatments for PTSD. The trauma response is referred to as a mind-body state, which is the body's defense response to stress. The defense response incorporates both the physiological reaction and the individual's subjective interpretation of his or her body state. The therapeutic relationship also plays a role in molding the individual's perspective of their experience. The relationship component in therapy may help to regulate the patient's physiological arousal, since social engagement connects with the autonomic regulation of the heart and lungs. Simple shifts in body language, facial expressions or tone of voice can all influence the way in which the patient's autonomic system responds. Kozłowska et al. (2015) mentions common threads in the successful treatment of PTSD, which include aspects described above: creating a spatially or interpersonally calm, safe space, regulation of affect, connecting with sense of self, and attuning to the psychobiological connection. In this type of environment, patients learn to regulate arousal and tolerate intense emotions that would essentially activate the defense response in the body (Kozłowska et al., 2015).

Yoga has been shown as effective in reducing symptoms of PTSD in a variety of populations (Carter et al., 2013; Staples et al., 2013), including women (Dick et al., 2014; Rhodes, 2015; Rhodes et al., 2016; Price et al., 2017). Trauma-based yoga interventions and programs, in particular, are comprised of important elements which target symptoms of the disorder such as dissociation, hypervigilance, avoidance and numbing (Khusid & Vythillingam, 2016) and may cultivate a therapeutic environment as Kozłowska et al. (2015) described above.

Based on the complexities underserved women face in their daily lives and considerations for treatment (Stockman et al., 2015), trauma-based yoga interventions and programs may address barriers to care and be a feasible intervention for this specific population (Dutton et al., 2013). The

literature has identified yoga as a flexible intervention that can be individualized and adapted to various environments (Dutton et al., 2013; Stockman et al., 2015). However, stressors and social, structural and political barriers need to be taken into account, in order to respond to women's needs (Stockman et al., 2015). To address the barriers related to the stigma surrounding mental health and medical services, flexible interventions that can be adapted to various environments and individualized should be considered. For example, discovering places where women feel safe can provide an opportunity and a space to establish a connection and build trust. Dutton et al. (2013) and Stockman et al. (2015) suggest interventions should be brought *to* the patients to further mitigate stressors and barriers.

Specific aspects of culture such as language, historical trauma, and social norms need to be explored further when addressing ways in which these women reach out for care, talk about the abuse with healthcare providers, and how they may respond to treatment and interventions. Components of a general yoga intervention such as mindfulness meditation, breath-work, physical postures and movement have been described. Collectively, these interventions have been effective in reducing symptoms of PTSD. However, there is a lack of continuity in yoga intervention methodologies found in the research literature (Stoller et al., 2011; Staples et al., 2013; van der Kolk et al., 2014, Rhodes et al., 2016; Price et al., 2017). It is unknown whether yoga interventions for underserved women who have experienced sexual trauma are based on theory or incorporate constructs known to facilitate healing from trauma. Therefore, it may be important to distinguish which theories and constructs are present and similar and/or different in yoga interventions for underserved women who have experienced sexual trauma. Additionally, identifying the reported positive outcomes within yoga interventions for underserved women who are survivors of sexual trauma may also be useful.



# CHAPTER 3: METHODS

## RESEARCH DESIGN

A descriptive research design was used to describe yoga interventions for underserved women who have experienced sexual trauma from the research literature. Specifically, theories and constructs incorporated into these yoga interventions were identified, and similarities and differences in constructs across interventions were described. Additionally, this research sought to identify positive outcomes reported within yoga interventions for underserved women who have experienced sexual trauma. Subsequently, this research sought to describe perceived “gold standard” trauma-based yoga training programs in the United States. Specifically, theories incorporated into training programs were identified. Finally, whether or not perceived “gold standard” trauma-based yoga training programs incorporated constructs found in yoga interventions for underserved women who have experienced sexual trauma was identified. The descriptive research strategy for both yoga interventions for underserved women who have experienced sexual trauma and perceived “gold standard” trauma-based yoga training programs in the United States is outlined in **Table 1**.

**Table 1.** *Descriptive Research Strategy*

Yoga Interventions for Underserved Women who have Experienced Sexual Trauma from the Research Literature	Perceived “Gold Standard” Trauma-Based Yoga Training Programs in the US
<p><u>Published Articles</u></p> <p><i>Describe:</i></p> <ul style="list-style-type: none"><li>· Theories &amp; Constructs - <b>Similarities &amp; differences</b></li><li>· Positive outcomes reported</li></ul>	<p><u>Internet Search &amp; Snowball Effect</u></p> <p><i>Describe:</i></p> <ul style="list-style-type: none"><li>· Theories &amp; Constructs</li><li>· Identify whether constructs from yoga interventions for underserved women who have experienced sexual trauma are used</li></ul>

### **Yoga Interventions for Underserved Women who have Experienced Sexual Trauma**

#### Methods

Information for this descriptive research involved collecting published articles from the research literature related to yoga interventions, PTSD and underserved women who are survivors of sexual trauma. The Maureen and Mike Mansfield Library database at the University of Montana was

used. Specific databases included Anthropological Index Online, Cochrane Library, CINAHL Complete, JSTOR, PILOTS, PsychINFO, PubMed and Google Scholar. The following criteria was used for study inclusion in the review: (1) the article was peer-reviewed, (2) the article was published sufficiently recent (between 2007 and 2017) to ensure that outdated interventions and theories were excluded, (3) the intervention incorporated some form of yoga, and (4) the article contained information on the effects of yoga for underserved women who have experienced trauma, sexual trauma or have PTSD. Inclusion criteria for yoga interventions encompassing underserved women who have experienced sexual trauma is summarized in **Table 2**.

**Table 2: Inclusion Criteria: Yoga Interventions for Underserved Women who have Experienced Sexual Trauma**

- ⇒ Peer-reviewed
- ⇒ Published between 2007 and 2017
- ⇒ Yoga Intervention
- ⇒ Underserved women
- ⇒ Effects of yoga on trauma, sexual trauma, or PTSD

Search Strategy

Initially, a narrow search was conducted to obtain articles on yoga interventions applied specifically to underserved women who have experienced sexual trauma. A broader search was then conducted to identify articles on yoga interventions applied to underserved women who have experienced trauma (in general) and/or diagnosed with PTSD. The following key words were

**Figure 1: Search Strategy: Yoga Interventions for Underserved Women who have Experienced Sexual Trauma**



entered into the database via the advanced search option: “yoga” , “trauma informed yoga”, “trauma sensitive yoga”, “trauma based yoga” “yoga interventions”, “yoga protocols”, “women”, “sexual trauma”, “sexual

abuse”, “sexual violence”, “intimate partner violence”, “sexual assault”, “rape”, “childhood sexual assault”, “adult sexual abuse”, “underserved”, “low socioeconomic status”, “ethnic minority”, and “minority”. The strategy for collecting published articles encompassing yoga interventions for underserved women who have experienced sexual trauma is summarized in **Figure 1**.

### Organization & Description of Information

After identifying relevant articles, NVivo software was used to organize and manage data collected. More specifically, the software was used as a tool to categorize information related to theories and constructs, positive outcomes reported in yoga interventions for underserved women who have experienced sexual trauma.

## **Gold Standard Trauma-Based Yoga Training Programs in the United States**

### Methods

Following the collection of published articles, an internet search and snowball effect was used to identify trauma-based yoga training programs in the United States. This search was narrowed in order to identify training programs that were perceived as the “gold standard” or deemed “evidence-based”. Because there is not a nationally recognized trauma-based yoga training program “gold standard”, for the purpose of this search “gold standard” was defined as: “a trauma-based yoga training program that has been tested in a randomized controlled trial and has a reputation in the field as a reliable method for trauma recovery” (Cardoso, Pereira, Iversen, & Ramos, 2014; Bothwell, Greene, Podolsky, & Jones, 2016). Additionally, a “gold-standard” or “evidence-based” trauma-based yoga training program also requires applicants to be a certified yoga instructor or at least a master’s level mental health care provider and requires 100+ hours or more to obtain certification (Dutton et al., 2013). The following key words were used in the internet search: “yoga training programs”, “yoga programs”, “trauma-informed”, “trauma-sensitive”, “trauma-based”, “trauma-specific”, “training”, “training programs”, “United States”, and “evidence-based training programs”. Inclusion criteria for trauma-based yoga training programs in the United States is summarized in **Table 3**.

**Table 3. Inclusion Criteria: Perceived “Gold Standard” Trauma-Based Yoga Training Programs in the United States**

Gold Standard Trauma-Based Yoga Training Programs
<p><u>Internet Search &amp; Snowball Effect</u></p> <p><b>Perceived “Gold Standard” or “Evidence-Based”:</b> <i>A trauma-based yoga intervention that has been tested in a randomized controlled trial and has a reputation in the field as a reliable method for trauma recovery</i> (Cardoso, Pereira, Iversen &amp; Ramos, 2014; Bothwell, Greene, Podolsky &amp; Jones, 2016)</p> <ul style="list-style-type: none"><li>• <b>AND</b> requires applicants to be a certified yoga teacher OR at least a master’s level mental health care provider</li><li>• <b>AND</b> requires 100+ hours to become certified</li></ul>

Description of Information

An internet search was used to identify perceived “gold standard” or “evidence-based” trauma-based yoga training programs in the United States. Trauma-based yoga training program websites were reviewed to obtain information regarding theories and constructs used within the training programs. Subsequently, constructs that were similar to those used within yoga interventions for underserved women who have experienced trauma were identified.

## CHAPTER 4: RESULTS & RECOMMENDATIONS

Published articles encompassing yoga interventions for underserved women who have experienced sexual trauma were reviewed for theories and constructs, and similarities and/or differences of constructs across these yoga interventions. Additionally, positive outcomes reported within yoga interventions for underserved women who have experienced sexual trauma were described. Furthermore, one perceived “gold standard” or “evidence-based”, trauma-based yoga training program in the United States was identified and reviewed, specifically for theories incorporated into the training program. Subsequently, whether the training program incorporated constructs similar to those applied in research-based yoga interventions for underserved women who have experienced sexual trauma was identified.

Included below are descriptions of yoga interventions for underserved women who have experienced trauma, sexual trauma, or have PTSD from published articles. Brief descriptions of the perceived “gold standard” trauma-based yoga training program, recommendations and application of descriptive research are also included.

### RESULTS

#### **Yoga Interventions for Underserved Women who have Experienced Trauma, Sexual Trauma or have PTSD**

##### Literature Search Results

A total of five relevant articles specific to yoga interventions for underserved women who have experienced trauma, sexual trauma, and/or whom have PTSD were found in the research literature. Two articles explicitly stated women had histories of sexual trauma (Vallejo & Amaro, 2009; Rousseau & Jackson, 2013). One article reported at least one participant who experienced sexual trauma (Smoyer, 2016). One article included women who *all* experienced intimate partner violence (IPV), and one article did not explicitly state any specific traumatic experiences (Brown, Eubanks & Keating, 2017). Not all research-based yoga interventions for underserved women explicitly stated that *all* participants experienced “sexual” trauma. Therefore, the yoga interventions described will include underserved women who have experienced some form of trauma (i.e. sexual, physical, mental, emotional, etc.).

**Table 4. Yoga Interventions for Underserved Women who have Experienced Trauma: Purpose, Objectives, Population, Stressors/Trauma**

Article	Population Characteristics	Life Stressors and/or Traumas	Yoga Intervention	Purpose of Intervention	Objectives of Intervention
VALLEJO & AMARO (2009)	Low-income, inner-city, African American & Latina Women	Majority: history of sexual and/or physical abuse; lost support of families; previously homeless or imprisoned at least once; lost custody of children; substance abuse & relapse	MBRP-W (adapted MBSR)	Address role of stress in relapse to reduce risk of HIV infection	1) Refine self-regulatory skills 2) Increase relaxation & awareness skills 3) Decrease symptoms of stress & stress reactivity 4) Increase overall sense of well-being and prevent relapse
ROUSSEAU & JACKSON (2013)	Low-income Haitian women (living in temporary housing areas in Port-au-Prince, Haiti)	Multiple, complex traumas: gender-based sexual & physical violence (IPV), displacement, loss of loved ones, physical & emotional trauma, earthquake	TIMBo	Address the psycho-social, emotional, and physiological root causes of chronic trauma, addiction, and/or abuse & enable women to heal from trauma and improve emotional regulation naturally	1) Provide simple, effective & accessible tools to utilize as active coping strategies for self-regulation 2) Increase awareness of bodies & body sensations → developing understanding of emotional anatomy 3) Renegotiate self-belief through awareness of inner experience 4) Develop understanding of fundamentals of how stress and trauma affect the body & mind, & how mindfulness practices work to reverse effects of traumatic stress
DUTTON ET AL. (2013)	low-income predominately African American women	Cumulative life stressors: poverty, racial discrimination, family instability & trauma experiences; history of IPV; all had PTSD	Adapted MBSR	Find out feasibility and acceptability of MBSR for population	Decrease PTSD symptoms by increasing awareness of sensory, cognitive and affective responses as they arise; decreasing rumination about traumatic events and reduction of perceived stress
SMOYER (2016)	Low-income women: race/ethnicity not disclosed among 28 participants of intervention; Interview sample: 7 White, 1 Latina, & 2 African American	Substance abuse issues & survivors of lifetime trauma: overdose, loss of parental custody, eviction, accidental death of fiancé, survival sex (exchange of sex for shelter, money, or food), physical assault; incarceration; homeless or unstably housed	Trauma-Informed Yoga	“Create a sustainable network of yoga classes for people who would be otherwise unable to practice on a regular basis” (p.66)	1) Identify expectations and experiences of women who participate in the intervention 2) Assess feasibility & acceptability of using class leaders with limited yoga training instead of certified yoga instructors -
CONSTANTINE BROWN, EUBANKS & KEATING (2017)	Low-income women with mental illness receiving services in a community-based agency; Primarily Hispanic	PTSD – Depression & Anxiety  <i>Type of trauma not explicitly stated; receiving services at agency for less than 3 months; parenting responsibilities, financial stressors and environmental stressors</i>	Professional Yoga Therapy	1) Explore six-week yoga intervention’s effect on the quality of life, anxiety, and PTSD/trauma symptomatology of low-income adult parents with mental illness 2) Explore client experiences of yoga practice	1) Increase quality of life 2) Decrease anxiety and PTSD/trauma symptomatology

All five published articles incorporated some form of yoga for underserved women who have

experienced trauma. Two articles implemented an adapted form of Mindfulness-Based Stress Reduction (MBSR) (Vallejo & Amaro, 2009; Dutton et al., 2013), originally developed by Kabat-Zinn (1991). Trauma-Informed Yoga, which used principles from the Trauma Center's Trauma-Sensitive Yoga (TSY) program (TCTSY, 2017), a Professional Yoga Therapy program, and Trauma-Informed Mind Body (TIMBo) Program were implemented in the remaining articles (Smoyer, 2016; Brown et al., 2017; Rousseau & Jackson, 2013). To provide context for yoga interventions for underserved women who have experienced trauma, the purpose and objectives of each yoga intervention, characteristics of the population, life stressors and/or traumatic experiences of participants within each study are outlined in **Table 4**.

#### Theory-Based Yoga Interventions for Underserved Women who have Experienced Trauma

TIMBo was the only yoga intervention that was explicitly based on theory (Rousseau & Jackson, 2013). Specifically, the structure of TIMBo included constructs based on Relational Theory. Relational theory informed the gender-responsive approach of TIMBo, and encompassed the idea that women are more likely to be motivated by relational concerns and a sense of relatedness and connection (Rousseau & Jackson, 2013). Therefore, each TIMBo session opened with group discussion surrounding a particular theme or emotion (Rousseau & Jackson, 2013). Rousseau and Jackson (2013) noted the group setting promoted a cooperative environment, where women received peer feedback, and began to cultivate prosocial interpersonal patterns (Rousseau & Jackson, 2013).

Even though TIMBo was the only yoga intervention that explicitly integrated theory, all yoga interventions for underserved women who have experienced trauma incorporated constructs *related* to theories and conceptual frameworks (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

#### Similarities in Constructs

All yoga interventions for underserved women who have experienced trauma integrated constructs such as: 1) Ecological Perspective 2) Yoga Philosophy, 3) Trauma, 4) Gender-Responsive Strategies, and 5) Self-Empowerment (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Similarities in constructs are outlined below.

### *1) Ecological Construct*

Applying an ecological perspective addressed barriers that underserved women may face in accessing yoga such as stigma and cultural barriers. Yoga interventions were not only made accessible, but convenient (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). The ecological perspective behind all five yoga interventions considered the social contexts in which underserved women were born, grew up, worked and lived. These interventions utilized strategies such as collaboration and partnership development, which consequently addressed both barriers to accessing yoga (Dutton et al., 2013) and cultural barriers underserved women may face (Rousseau & Jackson, 2013).

Implementation of MBRP-W resulted from a collaboration between a substance abuse treatment center (Boston Consortium of Services for Families in Recovery (BCSFR)) and the Center of Mindfulness in Medicine, Healthcare, and Society (CFM). A facilitator from the CFM provided yoga to underserved women enrolled in treatment at the BCSFR (Vallejo & Amaro, 2009). Similarly, the implementation of Trauma-Informed Yoga resulted from a collaboration between a substance abuse treatment center (SAP) and a nonprofit organization which trains volunteers/yoga practitioners to facilitate Trauma-Informed Yoga (Smoyer, 2016). Though the Professional Yoga Therapy and adapted MBSR interventions did not develop partnerships with other organizations for the purpose of finding or training instructors, collaborations with women's shelters and community health agencies were needed to bring yoga *to* underserved women (Brown et al., 2017; Dutton et al., 2013).

All yoga interventions for underserved women who had experienced trauma were offered where women were already engaging in daily activities (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Locations included community-based addiction treatment settings (inpatient and outpatient) (Vallejo & Amaro, 2009; Brown et al., 2017), tent communities and domestic violence shelters where women resided (Dutton et al., 2013; Rousseau & Jackson, 2013), nearby community hospitals (Dutton et al., 2013; Brown et al., 2017), and the cafeteria of a public elementary school near the residential treatment housing (Smoyer, 2016). Dutton et al.'s (2013) rationale for using MBSR specifically, was that it did not require a mental health treatment setting, therefore potentially reducing stigma associated with treatment (Dutton et al., 2013).



Not only did the implementation of yoga interventions for underserved women seek to make yoga accessible and convenient, but partnership development between two organizations fostered a culturally competent yoga intervention (Rousseau & Jackson, 2013). Two organizations, yogaHOPE and AMURT-Haiti, used a participatory, community-based approach to develop a culturally competent yoga intervention for Haitian women. TIMBo used a “Train-the-Trainer” model to educate Haitian community leaders on how to facilitate TIMBo, and to hold a space for group discussion, breathing exercises, yoga postures and meditation. Throughout the development, training and implementation of TIMBo, many adaptations were necessary to address differences in culture (Rousseau & Jackson, 2013).

Components of TIMBo required culturally appropriate adaptations in the translation of materials. Due to language and literacy issues, and because Haiti is a storytelling culture, more pictures, photos, diagrams and references specific to Haitian culture were added to the TIMBo workbook. Sanskrit terms often used in yoga, were excluded due to possible Haitian religious and spiritual belief conflicts. Furthermore, barriers to women participating stemmed from gender-specific norms. To address the gender dynamic, male community members completed the TIMBo certification to debrief husbands or answer any questions specific to the intervention. The ongoing monitoring, implementation and adaptation of TIMBo allowed researchers and partners to provide a culturally competent yoga intervention for underserved women who have experienced lifelong, sexual and gender-based trauma (Rousseau & Jackson, 2013).

Overall, Rousseau & Jackson (2013) highlighted that the use of an ecological perspective in addressing the social determinants of health promotes a “rights-based” strategy. This “rights-based” strategy addressed barriers to participation including access to yoga interventions, stigma associated with mental health, and cultural barriers by developing partnerships prior to implementation (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Ultimately, using an ecological perspective for the implementation of yoga interventions for underserved women who have experienced trauma may make strides toward eliminating poverty and help create opportunities for underserved women to connect with their potential (Rousseau & Jackson, 2013).

## 2) Yoga Philosophy

All five yoga interventions for underserved women who have experienced sexual trauma incorporated constructs from Yoga Philosophy. Specifically, interventions emphasized mindfulness as a construct (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Though all yoga interventions offered breathwork, yoga posture and meditation, only four interventions offered *instruction* on each component throughout the intervention (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Brown et al., 2017). Three interventions focused on acceptance and a reduction in judgment (Vallejo & Amaro, 2009; Dutton et al., 2013; Brown et al., 2017), one intervention highlighted finding meaning and purpose (Brown et al., 2017), and two emphasized interconnectedness and one's ability to utilize inner resources for healing (Vallejo & Amaro, 2009; Dutton et al., 2013).

Mindfulness is woven throughout all of the yoga interventions for underserved women who have experienced sexual trauma. Women were encouraged to pay attention to the present moment on purpose. Verbal cues from instructors encompass a sense of nonjudgment toward the self and encourage participants to be curious about their experience (Niles et al., 2012). Physical postures and movement, such as walking, and breathing exercises are used to cultivate mindfulness and assist with sustained attention on the present moment (Vallejo & Amaro, 2009; Dutton et al., 2013). Focus on the present moment included awareness of physical sensations and emotions as they came up (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

The adapted MBSR and MBRP-W interventions held true to the MBSR program's core beliefs of interconnectedness, the idea that wholeness is inherent in human life, the understanding that regardless of what is happening, there is always more good than bad, and that individuals have inner resources available that may be used for healing (Vallejo & Amaro, 2008; Dutton et al., 2013). These constructs may be related to the idea that individuals are holistic entities and healing comes from within from ancient yogic philosophy (Woodyard, 2011; Anodea, 2004). Additionally, accepting one's present situation emphasizes a reduction in negative-self-judgment, seeks to promote self-acceptance and contentment, and encourages women to find meaning and purpose (Brown et al., 2017).

### 3) Trauma

Though none of the yoga interventions for underserved women who experienced trauma explicitly incorporated trauma theory, a variety of constructs similar to those used in trauma theory were present. All yoga interventions focused on increasing self-management through choice and control, exposure to internal experience, and establishing safety and predictability (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). One intervention used principles from Trauma Sensitive Yoga (TSY) (Smoyer, 2016). Additionally, three focused on cognitive change (Vallejo & Amaro, 2009; Dutton et al., 2013; Brown et al., 2017). In one way or another, each construct related to the biological, emotional, and cognitive impacts of trauma (van der Kolk, 2006, Goodman & Calderon, 2012).

Invitatory language was used to provide the opportunity for women to regain a sense of choice and control over their experience (Emerson & Hopper, 2011; Smoyer, 2016). Women were continually given the option to “opt out” of any of the yoga postures or components of the intervention (Smoyer, 2016). Multiple variations of each pose were explained, and participants were invited to choose which suited them the best in that moment (Rousseau & Jackson; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Yoga interventions for underserved women who have experienced trauma may create a space for women to have choices and more control over one’s experience, and also promote a sense of safety (van der kolk, 2014; Emerson & Hopper, 2011).

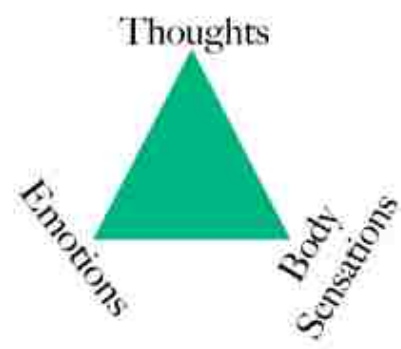
Participants were encouraged to continually bring attention back to the present moment. Focus on the present moment included awareness of physical sensations and emotions as they came up (Rousseau & Jackson; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Though focus throughout all yoga interventions was rooted and encouraged to stay within the present moment, the MBRP-W intervention *gradually* move awareness “inward”. Specifically, participants were asked to notice sounds first, and body sensations and points of contact with the ground, before awareness of breath. Attention directed toward the breath was found to result in either boredom, a misunderstanding, or even triggered traumatic memories for some women (Vallejo & Amaro, 2009).

Though exposure to internal experience was prevalent, both adapted MBSR interventions addressed effects of lifetime trauma. Body scan exercises that drew attention to previously abused areas of the body were avoided, and women were invited to complete exercises with eyes open to prevent re-traumatization and establish a sense of safety (Vallejo & Amaro, 2009; Dutton et al., 2013).

Each yoga intervention hoped to cultivate feelings of safety and predictability (Rousseau & Jackson; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). The structure of each class was kept consistent. For example, Professional Yoga Therapy sessions always began with a breathing exercise, transitioned to seated poses (in a chair or on the mat), to standing, and ended with supine poses and a final relaxation pose (Brown et al., 2017). TIMBo sessions always started with group discussion, followed by breathing exercises, and ended with yoga and meditation (Rousseau & Jackson, 2013). Additionally, Trauma-Informed Yoga was structured to be predictable and repetitive by arranging the yoga mats and props in the same way for every class each week. Safety was also promoted due to instructors who respected the physical space of participants and set clear boundaries through one's body language (Smoyer, 2016; Emerson & Hopper, 2011).

Professional Yoga Therapy encouraged the acceptance of one's present situation to reduce negative self-judgment, promote self-acceptance and contentment, and encourage finding meaning and purpose (Brown et al., 2017). These concepts capture the cognitive aspects of one's response to trauma (van der Kolk, 2006, Goodman & Calderon, 2012). For example, related to the concept of mindfulness, or paying attention on purpose and without judgment, women may begin to acknowledge thoughts, feelings, and sensations from an objective perspective (Niles et al., 2012). Additionally, the adapted MBSR interventions encouraged women to *practice* these skills through "assignments" and complete activities outside of class time (Vallejo & Amaro, 2009; Dutton et al., 2013). Additionally, MBRP-W incorporated a visual tool, "*Triangle of Awareness*", to remind women that senses could be used to bring awareness to thoughts, emotions and body sensations,

**Figure 2.** MBRP-W: *Triangle of Awareness*



and observe them separately. **Figure 2** represents a visual representation of MBRP-W's *Triangle of Awareness* (Vallejo & Amaro, 2009).

Yoga interventions for underserved women who have experienced trauma acknowledge individual responses to trauma and attempt to provide opportunities to heal. The research literature shows that these interventions seek to cultivate mindfulness skills to shift perspectives and cognition and create an environment and offer instruction that provides choices, a sense of control and establishes safety and predictability (Rousseau & Jackson; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

#### *4) Gender-Responsive*

Similar to Relational Theory, which informed the gender-responsive approach of TIMBo, all yoga interventions for underserved women who have experienced trauma encompassed the idea that women are more likely to be motivated by relational concerns and a sense of relatedness and connection (Rousseau & Jackson, 2013). Even though women are discouraged from talking about traumatic experiences in both MBSR interventions (Vallejo & Amaro, 2009; Dutton et al., 2013), yoga was practiced in a group setting, perhaps leading to group cohesiveness. This structure was conducive to fostering a connection between participants. Additionally, all yoga sessions were comprised of women, including facilitators (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

#### *5) Self-Empowerment*

Though the research literature did not explicitly state the use of a self-empowerment model in the planning of yoga interventions for underserved women who have experienced sexual trauma, constructs from this model are woven throughout all yoga interventions. (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). For example, MBSR emphasizes utilizing inner resources, which may evolve into feelings of self-empowerment for underserved women (Elliott, Bjelajac, Fallot, Markoff, & Reed, 2005; Vallejo & Amaro, 2009; Dutton et al., 2013). Additionally, three yoga interventions were structured in a way that provided an opportunity for women to accomplish physical postures within their ability level, and ultimately feel successful (Rousseau & Jackson, 2013; Smoyer, 2016; Brown et al., 2017). Specifically, foundational postures, breathing techniques, and meditations were introduced,

then built upon throughout the treatment cycle. These components were also repeated each week, to familiarize women with each skill or technique (Rousseau & Jackson; Smoyer, 2016; Brown et al., 2017). Finally, TIMBo explicitly focused on engaging empowering instruction rather than authoritative (Rousseau & Jackson, 2013).

### Summary of Similarities in Constructs

Incorporating constructs related to an ecological perspective addressed barriers underserved women face such as *access* to yoga. Through collaboration and partnership development strategies, all yoga interventions were accessible, convenient and potentially reduced stigma that is typically associated with mental health settings among underserved women. Additionally, mindfulness, was used as a construct throughout which created a space for exposure to internal experience and an opportunity for women to have a choice in their experience and regain control. Furthermore, the structure of all yoga interventions was repetitive and predictable. Not only did this intend to cultivate safety, but a sense of empowerment (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

### Differences in Constructs

Though there were many overarching similarities among all yoga interventions for underserved women who experienced trauma, details of the constructs within interventions differed. Differences were related to specific construct adaptations that were integrated to make the yoga intervention more appropriate for participants such as: 1) Relapse prevention, 2) Yoga philosophy 3) Ecological perspective, and 4) Trauma. Differences in constructs are outlined below.

#### *1) Relapse Prevention*

MBRP-W was the only intervention that incorporated constructs focused on relapse prevention due to the intervention's emphasis on substance abuse issues (Vallejo & Amaro, 2009). Women who participated in MBRP-W were in the early stages of relapse recovery and most were prescribed drugs for addiction. Therefore, MBRP-W respond to issues women faced such as, hyperactivity of the body, drugs prescribed that inhibit women's attention or alertness. Additionally, cognitions may be overstimulated, and increased attention on sensations of the body might increase cravings (Vallejo & Amaro, 2009).

To address concerns of hyperactivity and drowsiness, the four experiential practices of the original MBSR program were used, but the length, sequencing and approaches in presenting them varied. For example, meditations were shortened, due to the shortened attention span of women in the first stages of recovery. Instead of a 7-hour retreat, a 4-hour retreat was offered. Sequencing of each session was carried out in a non-sequential way to “meet participants where they were” (p. 200, Vallejo & Amaro, 2009). For example, in times of noticeable agitation or restricted energy, yoga movements were offered as a break from didactic exercises. Walking meditation began at a high intensity and gradually slowed and tapered off, typically preceding meditation (Vallejo & Amaro, 2009).

### *2) Exclusion of Yoga Philosophy*

Two yoga interventions explicitly left out the use of Sanskrit during instruction (Rousseau & Jackson, 2013; Smoyer, 2016) and one intervention did not give detailed instruction for yoga poses or breathing techniques. One reasoning for the lack of Sanskrit terms were due to religious considerations. Second, the Trauma-Informed Yoga intervention was facilitated by a substance abuse treatment volunteer who had only 10 hours of training in trauma-informed yoga. Therefore, an in-depth background of yoga facilitation was not present (Smoyer, 2016).

### *3) Ecological Perspective*

Though all yoga interventions utilized collaboration and partnership development strategies, ultimately making yoga accessible and convenient, the purpose of collaboration were different for three of the interventions (Vallejo & Amaro, 2009; Smoyer, 2016; Rousseau & Jackson, 2013). For instance, one intervention’s focus was on acquiring a trained facilitator in MBSR (Vallejo & Amaro, 2009), another partnered with an organization to train a current volunteer to facilitate Trauma-Informed Yoga (Smoyer, 2016), and one created a culturally competent yoga intervention for underserved women (Rousseau & Jackson, 2013). TIMBo, specifically, used collaboration and partnership development to gain access to community leaders. This led to a community-based participatory approach to TIMBo facilitation. Not only were Haitian community leaders trained to facilitate the program, but TIMBo emphasized cultural competency (Rousseau & Jackson, 2013).

#### 4) Trauma

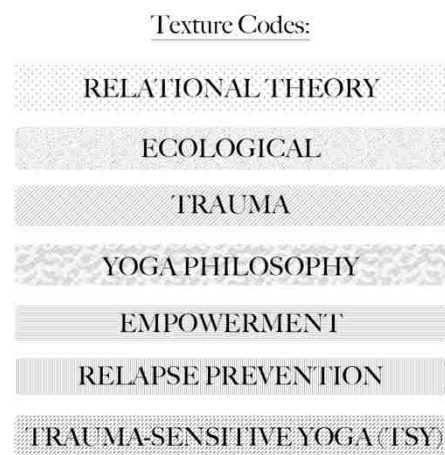
Two interventions, MBSR and MBRP-W emphasized constructs related to cognitive aspects of trauma such as utilizing inner resources and practicing skills for cognitive change. Interventions focused on providing underserved women with tools they could use in their daily lives such as “three-minute breathing space”. This practice was introduced to encourage women to pause in their daily life, instead of reacting to emotions immediately. Dyadic exercises were incorporated to help women cope with emotional arousal and restlessness, and participants were provided with home practices. Home practices included written “daily activities” and a CD or DVD to practice yoga and/or meditations (Vallejo & Amaro, 2009; Dutton et al., 2013).

#### Summary of Differences in Constructs

Incorporating constructs related to relapse prevention addressed concerns related to hyperactivity and drowsiness for underserved women in the first stages of relapse recovery (Vallejo & Amaro, 2009). Additionally, yoga philosophy constructs were excluded due to religious considerations and potentially a lack of in-depth yoga training background (Rousseau & Jackson 2013; Smoyer, 2016). Ecological perspectives addressed barriers underserved women face such as *access* to yoga, but also emphasized benefits including finding or training instructors to facilitate the yoga intervention and developing a culturally competent intervention. Finally, trauma constructs related to cognition were applied to facilitate practical skill building (Vallejo & Amaro, 2009; Dutton et al., 2013).

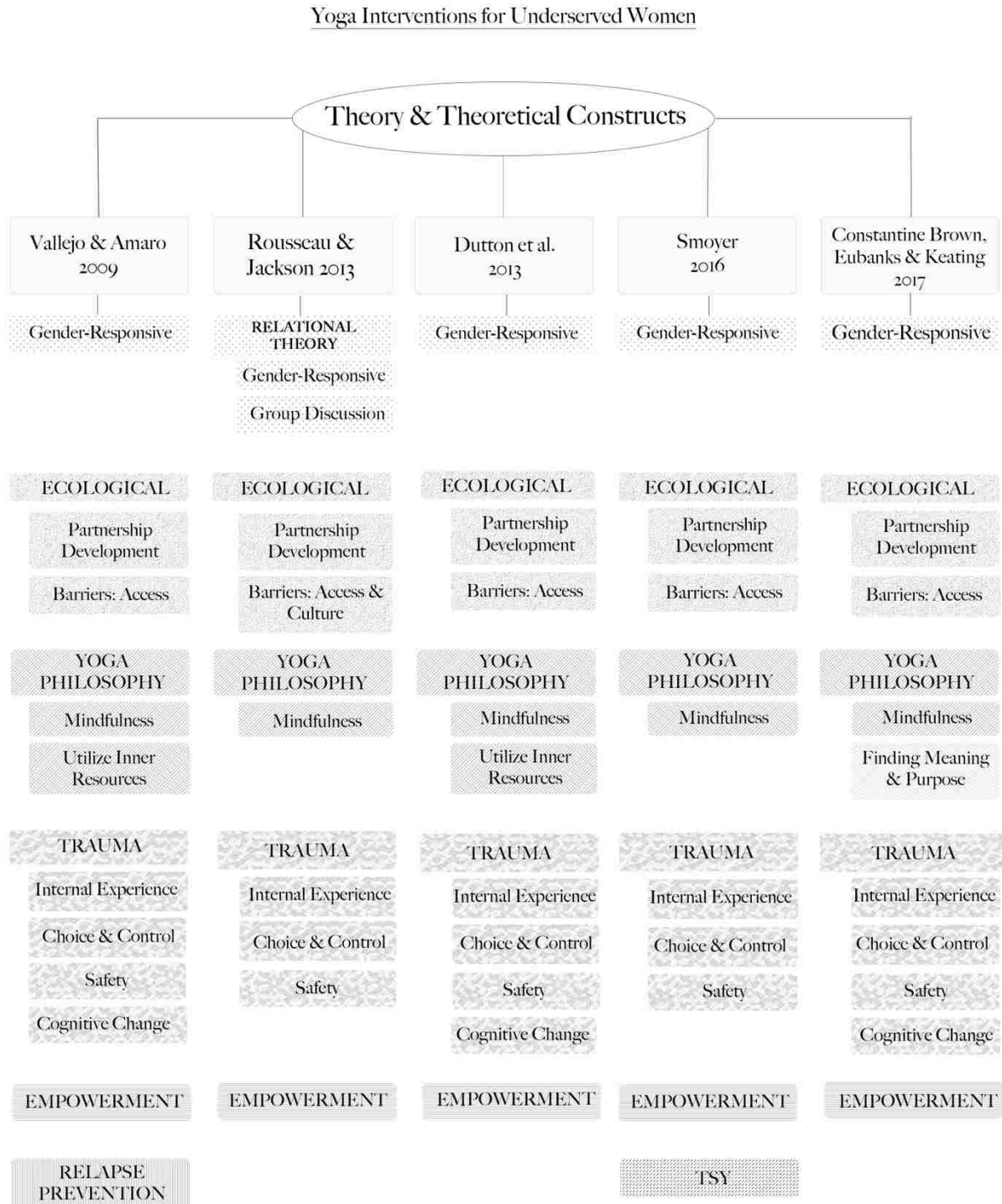
Included below is a visual description of theory and theoretical constructs applied in yoga interventions for underserved women who have experienced trauma. Texture codes are outlined in **Figure 3** and applied in **Figure 4**. The top row includes the specific article referenced, followed by theory and theoretical constructs applied in each yoga intervention. Related constructs are grouped together via texture.

**Figure 3.** *Texture Codes for Visual Description of Theory & Theoretical Constructs Represented in Figure 4.*





**Figure 4.** Overview of Theory & Theoretical Constructs Applied in Yoga Interventions for Underserved Women who have Experienced Trauma



### Positive Outcomes of Yoga Interventions for Underserved Women who have Experienced Trauma

Positive outcomes reported by participants throughout yoga interventions for underserved women who have experienced trauma were related to clinical outcomes such as anxiety, perceived stress (Vallejo & Amaro, 2009), symptoms of PTSD (Dutton et al., 2013; Smoyer, 2016), addition severity (Vallejo & Amaro, 2009) and quality of life (Brown et al., 2017). Additionally, women reported improvements in mental, emotional and physical well-being including increased awareness, acceptance, self-empowerment, non-reactivity, decreased arousal and/or distress, compassion for others, and ability to transfer skills learned from class into daily life (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

All yoga interventions for underserved women who have experienced trauma reported positive outcomes. Interestingly, positive outcomes did not seem related to whether or not yoga interventions were based on a theory or interventions that applied more constructs related to trauma theory specifically. For example, one yoga intervention, Professional Yoga Therapy, applied constructs related to yoga philosophy and ecological perspectives, and found statistically significant decreases in anxiety and PTSD symptom severity (Brown et al., 2017). As a comparison, an adapted version of MBSR applied constructs related to trauma specifically and found that an increased dose of yoga was associated with a significant reduction in drug and alcohol severity and perceived stress (Vallejo & Amaro, 2009; Amaro, Spear, Vallejo, Conron, & Black, 2014).

### **Perceived “Gold Standard”, Trauma-Based Yoga Training Programs in the United States**

#### Internet Search Results

Five relevant yoga training programs were identified as potential perceived “gold standard” trauma-based yoga training programs. However, four were excluded because they did not meet inclusion criteria. For instance, one training program, YogaFit for Warriors, was excluded because it did not require any pre-requisites to participation (i.e. 200 hours of yoga teacher training or master’s level mental health practitioner). Two programs, Kintla Yoga Therapy and Mindful Yoga Therapy, were excluded because they had not been tested in randomized controlled trials. Mindfulness-Based Stress Reduction was also excluded because the training program did not have a specific emphasis on trauma. Therefore, one perceived “gold standard” or “evidence-based”, trauma-based yoga training program, Trauma Sensitive Yoga (TSY), was included and described

below. Theories incorporated into this training program were identified. Subsequently, theories were examined to identify if they contained similar constructs also found in yoga interventions for underserved women who have experienced trauma.

### Trauma-Sensitive Yoga (TSY)

TSY is an “empirically validated, clinical intervention for complex trauma or chronic, treatment resistant – PTSD” (TCTSY, 2017). TSY is recognized as “evidence-based” by the National Registry of Evidence-based Programs and Practices (NREPP), which is published by the Substance Abuse and Mental Health Services Administration (SAMHSA). TSY was developed by the Trauma Center at the Justice Resource Institute in Boston, MA, intended to be used in conjunction with other treatments and for individuals who may have complex trauma (Clark et al., 2014; TCTSY, 2017).

To facilitate TSY classes, one must be certified as a yoga instructor with at least 200 hours of training and complete the Trauma Center’s 40-hour certificate program. Clinicians also have an opportunity to engage in a two-day training to be able to offer yoga in their clinical practice (Emerson et al., 2009). Additionally, the Trauma Center offers a 300-hour certification program that is open to yoga teachers and licensed mental health care practitioners. Applicants must also have prior training with the Trauma Center Yoga Program including a 20 or 40-hour in-person workshop or a 4.5-hour online e-course to be eligible to complete the 300-hour training (TCTSY, 2017).

### Theory

TSY is rooted in Trauma Theory, specifically related to complex trauma, and the practice of Hatha Yoga. Mental health care practitioners and yoga teachers trained to facilitate TSY learn about the impact of Complex and Developmental Trauma and PTSD (TCTSY, 2017). Traditional trauma theory typically addresses the cognitive and emotional aspects of trauma, whereas TSY acknowledges that many symptoms of trauma are somatically based (Emerson & Hopper, 2011). Additionally, TSY is framed around the idea that trauma affects the entire human system including mind, body and spirit. Therefore, the healing process must include the entire human organism (Emerson et al., 2009).

## Trauma Theory Constructs

Four trauma theory constructs are incorporated into TSY to assist survivors of trauma in recovery including: 1) present moment awareness, 2) making choices, 3) taking effective action, and 4) creating rhythms (Emerson & Hopper, 2011). Trauma theory constructs are outlined below.

### *Present Moment Awareness*

Survivors of trauma who participate in TSY are continually encouraged to bring awareness back to the present such as focusing on the body or breath. If participants are triggered by memories of one's traumatic experience during the yoga practice, facilitators may bring individuals back to the current moment by practicing interoception such as noticing physical sensations. Participants are also encouraged to notice the connection between physical sensation and mood or feelings. Present moment awareness may establish a sense of safety in survivors of trauma and individuals may begin to use present-awareness as a tool to stay grounded. (Emerson & Hopper, 2011).

### *Making Choices*

Variations and modifications are introduced for each yoga posture to give participants the opportunity to choose. Options to choose are continually offered to empower survivors of trauma to direct their own experience. Choices may range from opting out of the physical posture entirely, choosing which variation of the posture to practice, or experiment with their own version of the pose. Instructors are taught to foster invitational language that promotes inquiry. For example, instructors will use phrases such as, "notice," "be curious," "approach with interest," "allow," "experiment," "feel," etc. An invitational language and approach intends to create a space where individuals can make choices that fit their personal needs. This may encourage survivors to begin listening to their needs and practice self-care (Emerson & Hopper, 2011).

### *Taking Effective Action*

Taking effective action also involves concepts of choice and control. However, "taking action" in one's choices may involve changing one's external environment in order to feel more comfortable or calmer. For example, participants may self-direct to use a block to support a yoga posture or close/open a window to make the temperature of the room more comfortable (Emerson et al., 2009). When survivors of trauma begin to take action for their own comfort or well-being, self-efficacy may begin to increase (Emerson & Hopper, 2011).

### *Creating Rhythms*

Traumatic experiences may disrupt an individual's biorhythms related to one's stress response, breathing, and sleep patterns. Survivors of trauma often feel disconnected from themselves and others. Therefore, TSY provides opportunities for participants to create rhythms with breath, yoga postures, and collectively with other participants during the yoga session. Participants may have their own rhythms of breath and movement or begin to sync with others in class. This aspect of yoga invites survivors of trauma to not only engage in the "rhythmical dance and exchange that characterizes human relationship" (p. 52, Emerson & Hopper, 2011), but begin to learn how to self-regulate breath, movement and emotions (Emerson & Hopper, 2011).

### Summary of Theory

Trauma Theory is rooted within TSY. Survivors of trauma are encouraged to maintain present-awareness. Practicing awareness that is focused on the body or breath is intended to give survivors tools to practice during potentially triggering experiences. Participants of TSY are offered choices throughout the yoga practice, and instructors use invitational language to allow survivors to direct their own experience. Similarly, participants are invited to take effective action by making adjustments in one's practice or external factors that will make them more comfortable or feel calmer. Finally, TSY teaches how to find rhythm in one's breath and body, and to become in-sync with others in the yoga class. Creating rhythms hopes to increase self-regulation and foster connection in survivors of trauma. These constructs derived from trauma theory encourage participants to listen to their bodies and direct their own experience. Ultimately, TSY hopes to encourage participants to make choices that support their individual well-being (Emerson & Hopper, 2011)

### TSY vs. Yoga Interventions for Underserved Women who have Experienced Trauma

TSY incorporates many constructs that are similar to those found in the research literature in yoga interventions for underserved women who have experienced trauma from the research literature. However, due to the unique experiences underserved women face, and adaptations the researchers continued to make throughout implementation (Vallejo & Amaro, 2009; Dutton et al., 2013; Rousseau & Jackson, 2013), there are many constructs that TSY training does not take into account.

TSY does not consider the social contexts or conditions in which underserved women live (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). TSY is directed toward survivors of trauma within the class setting but does not inform how to provide individuals *access* to yoga (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017). Additionally, cultural considerations for implementation are not considered within the TSY training program (Rousseau & Jackson, 2013). TSY adjusts sessions to fit individual needs but does not offer considerations to adapt the yoga session to particular populations. This may be also related to relational theory and gender-responsive considerations (Rousseau & Jackson, 2013). Finally, TSY does not emphasize an applicable method to teach skills that may translate to current stressors underserved women may be dealing with. For example, skills may include ways in which women can incorporate breathing techniques or postures into daily life. These constructs may capture the cognitive aspects of trauma recovery (Vallejo & Amaro, 2009; Dutton et al., 2013).

## SUMMARY OF RESULTS

### **Yoga Interventions for Underserved Women who have Experienced Sexual Trauma**

- ⇒ There are currently only five articles that have focused on yoga and underserved women who have experienced trauma, and only three articles specifically mentioned experiences related to sexual trauma (Vallejo & Amaro, 2009; Rousseau & Jackson, 2013; Smoyer, 2016). Therefore, further research on yoga interventions for underserved women who have experienced sexual trauma is needed.
- ⇒ Little theory was used within yoga interventions for underserved women who have experienced trauma. For example, only one intervention was explicitly based on theory (Rousseau & Jackson, 2013)
- ⇒ However, many constructs that relate to theories were applied to yoga interventions for underserved women who have experienced trauma. It is unclear which theory they were derived from specifically.
- ⇒ There were more similarities than differences among the constructs used in yoga interventions for underserved women who have experienced trauma.

### **Gold Standard Trauma-Based Yoga Interventions in the United States**

- ⇒ Currently there is only one trauma-based training program that meets the perceived “gold standard” in the United States.
- ⇒ Perceived “gold standard” trauma-based yoga training program are theory-based but may be too narrow to capture specific needs of underserved women who have experienced trauma.

## RECOMMENDATIONS

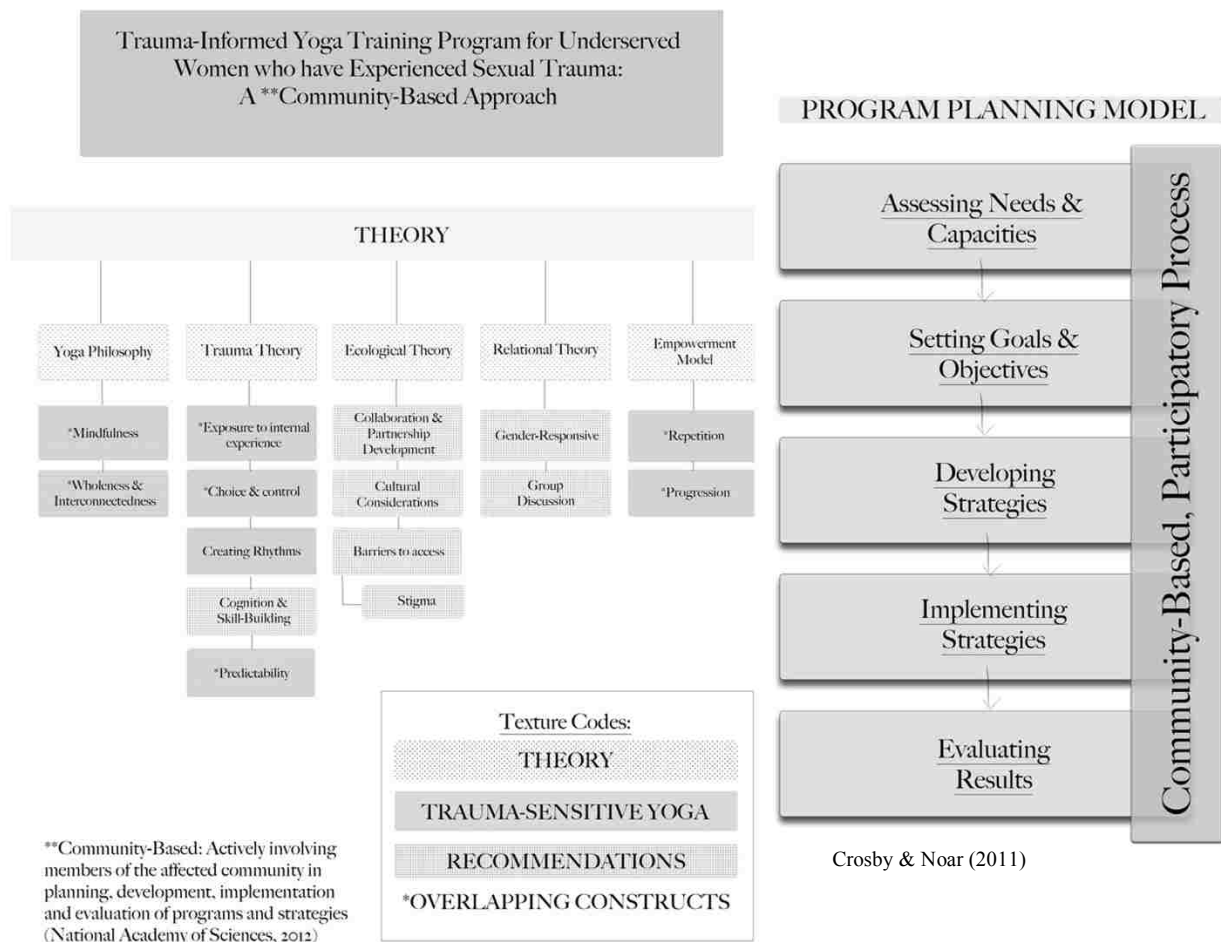
After identifying theories and constructs, along with similarities and differences across yoga interventions for underserved women who have experienced trauma, and theories within the perceived “gold standard” TSY training program, there are specific gaps that need to be addressed. First, there is a need for more research to inform yoga interventions for underserved women who have experienced sexual trauma, specifically. Second, gold standard trauma-based yoga training programs, or TSY, should incorporate more constructs that capture the unique experiences of underserved women who have experienced trauma. Recommendations for further research on yoga interventions for underserved women who have experienced sexual trauma and suggestions on ways to improve the gold standard trauma-based yoga training program (TSY) are included in **Table 5.**

**Table 5.** *Recommendations for Further Research & how to Adapt the Perceived “Gold Standard” Trauma-Based Yoga Training Program (TSY)*

RECOMMENDATIONS	
Yoga Interventions for Underserved Women who have Experienced Sexual Trauma from the Research Literature	Perceived “Gold Standard”, Trauma-Based Yoga Training Programs in the United States (Trauma-Sensitive Yoga)
More research is needed to inform yoga interventions <ul style="list-style-type: none"> <li>· Interventions should target underserved women who have experienced <i>sexual</i> trauma, specifically</li> <li>· Descriptors of samples should include specific racial/ethnic groups within underserved populations</li> </ul>	Need to incorporate considerations for underserved women from the research literature <ul style="list-style-type: none"> <li>· Ecological perspectives to address the social determinants of health (access &amp; culture)</li> <li>· Cognitive constructs (Focus on skills that can be transferred and applied to daily life)</li> <li>· Relational theory &amp; gender-responsive considerations</li> <li>· Program Planning Model (Adapt intervention based on population’s specific needs)</li> </ul>

The research literature encompassing yoga interventions for underserved women who have experienced trauma highlighted many important constructs that could be incorporated into the TSY training program. To build on the capacity of the perceived “gold standard” trauma-based yoga training program, TSY, recommendations would be to integrate: 1) ecological theory, 2) cognitive constructs (trauma theory), 3) relational theory and gender-responsive considerations including group discussion, and 4) a program planning model. An outline of an adapted trauma-based yoga training program, specifically for underserved women who have experienced sexual trauma, within a theory-based and standardized framework is described below and summarized in **Figure 5**.

**Figure 5. Recommendations for an Adapted TSY Training Program**





### *1) Ecological Theory*

An ecological approach to trauma recovery proposes that individual differences in one's traumatic response (and risk of exposure) are the result of complex interactions among the individual, the event itself and environmental factors. An ecological perspective acknowledges that one's response to trauma and recovery from are multidimensional. Additionally, there is an emphasis on capacities and strengths both within the individual and in one's environment (Harvey, 2007). Because there is significant power in social contexts, TSY should integrate a broader perspective of care for women who are survivors of trauma. For example, interventions should be knowledgeable about and responsive to contextual influences on one's risk for and recovery from trauma (Harvey, 2007). Specifically, stigma is often associated with mental health treatment settings (Dutton et al., 2013).

Therefore, yoga should be brought *to* women who are survivors of trauma such as domestic violence shelters or convenient locations in the community (i.e. cafeteria of a public school) (Dutton et al., 2013; Smoyer, 2016). Additionally, the influence of an intervention may depend on how its effects may be incorporated into the life and culture of the participants (Harvey, 2007).

### *2) Trauma Theory*

Though TSY applies many constructs from trauma theory, cognitive and skill-based constructs were missing that may help women integrate skills learned into one's daily life. Based on yoga interventions for underserved women who have experienced trauma, MBRP-W focused on specific stressors women faced, allowing instructors to address how women might apply skills practiced in class directly to situations in daily life (Vallejo & Amaro, 2009). Additionally, both adapted MBSR interventions provided "daily practices" and visual tools for women to contextualize and transfer skills learned (Dutton et al., 2013; Vallejo & Amaro, 2009).

### *3) Relational Theory*

Group discussions on specific topics were discussed in TIMBo sessions, not only to foster social support, but create a gender-responsive environment and apply skills and concepts to daily life (Rousseau & Jackson, 2013).

#### *4) Program Planning Model*

Finally, a program planning model such as the generalized model (Crosby & Noar, 2011) should be used when implementing a yoga intervention for underserved women who have experienced sexual trauma. A generalized model for program planning includes: assessing needs and capacities, setting goals and objectives, developing strategies, implementing those strategies and evaluating results (Crosby & Noar, 2011). It is important to note, the program planning process actively involves participation throughout all stages of development, implementation, and evaluation (National Academy of Sciences, 2012). Additionally, this requires continual evaluation and adaptation of the yoga intervention. Yoga interventions for underserved women from the research literature applied aspects of this process (Rousseau & Jackson, 2013; Vallejo & Amaro, 2009; Dutton et al., 2013; Smoyer, 2016; Brown et al., 2017).

MBRP-W was continually adapted throughout five cycles of implementation (Vallejo & Amaro, 2009). The first cycle of implementation included one class for women in substance abuse treatment, and the other for staff. Staff were educated on mindfulness skills and their relationship to stress in relapse prevention. Feedback resulted in the need for more direct focus on specific stressors faced by women in relation to relapse. Therefore, Vallejo & Amaro (2009) utilized a didactic approach to teach about the relationship between stress and relapse, and how mindfulness may be used as a tool for relapse prevention. Many challenges surfaced throughout the implementation of MBRP-W. However, due to the cyclical implementation of the program, Vallejo and Amaro (2009) were able to adapt the intervention to better serve the needs of underserved women with substance abuse issues and who have experienced trauma. Rousseau and Jackson (2013) approached the implementation of the Trauma-Informed Mind-Body Program (TIMBo) in a similar fashion but focused on providing a culturally competent program.

A participatory, community-based approach to addressing issues underserved women face was established through a partnership between yogaHOPE and AMURT-Haiti. The two organizations worked together to provide a yoga intervention to Haitian women in a culturally appropriate way. As mentioned previously, Rousseau & Jackson used a “Train-the-Trainer” model to train Haitian community leaders to provide a space for group discussion, breathing exercises, yoga postures and meditation. AMURT-Haiti’s teacher training teams consisted of curriculum developers, master trainers, educators, and support staff who developed and facilitated teacher training modules.

Throughout the cyclic development, training and implementation of TIMBo, many adaptations were necessary to address differences in culture (Rousseau & Jackson, 2013).

Components of TIMBo required many adaptations to become more culturally appropriate. For example, to address the gender dynamic, male community members completed the TIMBo certification to debrief husbands or answer any questions specific to the intervention. The ongoing monitoring, implementation and adaptation of TIMBo allowed researchers and partners to provide a culturally competent yoga intervention for underserved women who have experienced lifelong, sexual and gender-based trauma (Rousseau & Jackson 2013).

Overall, limited theory was used within yoga interventions for underserved women who have experienced trauma. However, many constructs that are related to trauma theory and address the social determinants of health were applied. Additionally, there were more similarities than differences among yoga interventions for underserved women who have experienced trauma. Ultimately, further research on yoga interventions for underserved women who have experienced sexual trauma is needed. Currently, there is only one trauma-based training program (TSY) that meets the gold standard in the United States. However, constructs applied in TSY may be too narrow to capture specific needs of underserved women who have experienced trauma. Therefore, it is recommended that TSY is adapted based on constructs found in yoga interventions for underserved women who have experienced trauma from the research literature.

## APPLICATION OF RESEARCH

This descriptive research sought to understand theories and constructs applied in yoga interventions for underserved women who have experienced sexual trauma and identify similarities and differences in constructs across these yoga interventions. Next, this research sought to identify positive outcomes reported in yoga interventions for underserved women who have experienced sexual trauma. Additionally, after developing an understanding of the theory within existing “gold standard” or “evidence-based”, trauma-based yoga training programs in the United States, whether training programs incorporated constructs similar to those applied in yoga interventions for underserved women who have experienced sexual trauma was identified.

Ultimately, this descriptive research helped identify similarities and differences in constructs across yoga interventions for underserved women who have experienced sexual trauma, and gaps within the yoga interventions. Additionally, this research identified whether trauma-based yoga training programs in the United States were incorporating theoretical constructs applied in yoga interventions for underserved women who have experienced sexual trauma. Collectively, this provided information for the development of an adapted trauma-based yoga training program, specifically for underserved women who have experienced sexual trauma, within a theory-based and standardized framework.

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