Experiential accounts of pregnant women with self-reported symptoms of PTSD, who do yoga

A research project submitted in partial fulfilment of the requirements for the degree of

Research Master of Arts in Psychology

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Declaration

I declare that this research report is my own, unaided work. It is submitted for the degree of Research Master of Arts in Psychology at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Ethics Clearance number: H16/05/23
(Certificate in Appendix)

Signed this 16th day of April 2021

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Abstract

The vulnerability of the foetus, infant and developing child to maternal mental illness, the inter-generational impact of trauma, and the beneficial and healing effect of yoga and meditation on aspects of trauma is well-documented. However, there are no studies on the intersection between PTSD, yoga and meditation, and pregnancy. This study explores the experiences of seven participants who do eight weeks of yoga and meditation in their second trimester of pregnancy, and any impact on their self-reported symptoms of PTSD. The importance of trauma research is evident given the high exposure to trauma of women in South Africa, the likely high numbers of South African pregnant women with symptoms of PTSD, the evidence of heightened vulnerability to aspects of PTSD in pregnancy, and the accompanying long-term effects in infancy, childhood, and adolescence. The impact of doing yoga and meditation as a beneficial intervention for PTSD during pregnancy was explored. The study used a qualitative and longitudinal study design with exploratory case studies, and participants were selected using purposive sampling. Data from semi-structured interviews was gathered at four different time periods: three during pregnancy, and the fourth after birth. Further data sets consisted of recordings from the yoga and meditation sessions, journaling from participants, and feedback from the yoga and meditation program instructors. Data sets were analysed using Thematic Analysis. All seven participants experienced a reduction in their self-reported symptoms of PTSD during the yoga and meditation program, and these changes persisted beyond the birth of their child. All participants used the tools they had learned to assist them during labour; such tools included chanting, breath practices, visualisation, and meditation. The participants who experienced previous traumatic births used the tools to prevent further re-traumatisation.

Acknowledgements

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To my lineage: May this work play some part in recreating the stories we tell our children.

"The children of the world are innocent, vulnerable and dependent. They are also curious, active and full of hope. Their childhood should be one of joy and peace, of playing, learning and growing. Their future should be shaped in harmony and cooperation. Their lives should mature, as they broaden their perspective and gain new experiences."

Declaration on the Survival, Protection and Development of Children: World Summit for Children, 30 September 2001.

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Research Aim

The aim of this study was to explore how women with self-reported symptoms of PTSD and in the second trimester of pregnancy described their experiences of an eight-week yoga and meditation program.

Chapter One: Introduction and Rationale

South Africa's transition from apartheid to a non-racial democracy, accompanied as it was by political violence and oppression, brought with it a legacy of socioeconomic inequalities and criminal violence, with the result that over 80% of South Africans are exposed to trauma, often multiple times (Atwoli et al., 2013). The nationally representative South African Stress and Health Study (SASH) found the overall incidence of experiencing potentially traumatic events (PTEs) in South Africa was 73.8% of the study population of 4315 participants (Atwoli et al. 2013). South African women and girls, according to SASH, are significantly more vulnerable to abuse by an intimate partner, rape, and other sexual assaults, collectively termed "gender-based violence" (Kaminer & Eagle, 2010). Of the categories of PTEs identified in the SASH study, witnessing a PTE (20.5%) was second only to physical violence (20.9%), with the two categories together making up over half of the total percentage of PTEs (Atwoli et al., 2013). This affords a disturbing insight into the exposure of South Africans to experiencing trauma at least once, and often multiple times during their lives, and to the heightened vulnerability of South African women and girls.

South Africa has one of the highest crime rates in the world, with Pretoria, Pietermaritzburg, Durban, and Johannesburg numbering second, fifth, sixth and seventh respectively, as the most dangerous cities in the world in which to live (Numbeo, 2020). The prevalence of sexual violence in South Africa is among the highest in the world (van der Walt et al., 2014) earning South Africa the label, "rape capital of the world" in a Human Rights Watch report in 1995 (Kaminer & Eagle, 2010). A 1999 Human Rights Watch comparison with eighty-nine Interpol member states found that South Africa has the highest ratio of reported rape cases per 100 000 in the population (Kaminer & Eagle, 2010). Femicide rates in South Africa are five times the global average, and South Africa is fourth in the world for countries with the highest rates of the murder of women (Head, 2019).

Rape is the most severe form of sexual violence; rape survivors are subject to long-term psychopathological sequelae, various forms of dysfunction and continuing disability, in

addition to the physical sequelae of injury, pregnancy, HIV transmission and other undesirable conditions (van der Walt et al., 2014). The WHO report on maternal health (2008) identifies intimate partner violence (IPV) as a risk factor for developing mental health problems, and women who experience IPV are three to five times more likely to develop mental health problems. Almost one in three women who have been raped develop PTSD, in comparison with one in twenty who have not been raped. The relationship between IPV and mental health problems is well-documented, with PTSD and depression as the most common resulting disorders, often co-occurring (Tomlinson, 2014). Pre-existing mental health problems, when they co-occur with an unwelcome pregnancy, can manifest as depression, substance abuse or suicide attempts.

Maternal mental disorders are on average three times more prevalent in low- and middle-income countries (LMICs), with anxiety and depression the third leading cause of disease globally for women between fourteen and forty-four and expected to reach first place by 2030 (Honikman et al., 2012; Tsai and Tomlinson, 2012). Despite considerable evidence pointing to the need for maternal mental health care, public health care priorities in South Africa are to decrease maternal and infant deaths, and to support infant physical health care (Kathree et al., 2014). Epidemiological studies in South Africa show high prevalence rates of depressed mood amongst pregnant and postnatal women, and yet routine screening or treatment for maternal mental disorders in primary care settings in South Africa is either nonexistent (Honikman et al., 2012) or inadequate (van Heyningen et al., 2014). The Perinatal Mental Health Project, an independent initiative based at the University of Cape Town that provides mental health services for pregnant and postnatal women, has validated a user-friendly mental health screening tool for frontline workers to use in non-specialist public health contexts (van Heyningen et al., 2014). However, the screening tool focuses on depression and anxiety and not on symptoms of PTSD.

Despite the usefulness of this tool, the reality of primary care in South Africa is that an average of three antenatal visits are allotted to maternal care in primary care settings, reaching 92% of the pregnant population, and the focus during these visits is on physical, not mental examination (Honikman et al., 2012). Extra visits to address mental health referrals incur additional expense involving time, loss of income, child-care, and possible travel costs, and are at the expense of the pregnant women. At postpartum visits, infant growth monitoring, HIV testing, and immunization claim the focus of attention.

The prevalence for depression in Khayelitsha, a small community outside Cape Town, South Africa, was found to be between 32-47% during pregnancy and between 16-35% within a year of birthing (Tsai & Tomlinson, 2012). In KwaZulu-Natal province (KZN) where HIV prevalence is high, 47% of pregnant women received a diagnosis of depression in their third trimester (Rochat et al., 2011). There is ample evidence for the comorbidity of PTSD and depression (Bleich et al., 1997; Breslau et al., 2000; Stein & Kennedy, 2001), and the dose response impact on physical health (Rytwinski et al., 2014), and ample evidence that a lower socioeconomic status (SES) such as in rural areas of KZN and in Khayelitsha, is associated with an increased occurrence of mental illness (Choi et al., 2015; Myer et al., 2008; Tomlinson, 2014). Yet there is no routine testing for symptoms of PTSD in antenatal primary care settings in South Africa when depression is indicated.

The impact of postpartum maternal mental health on infant socio-emotional and cognitive development, and physical growth, is well documented (Cooper et al., 2009; Cooper et al., 2018; Honikman et al., 2012; Kathree et al., 2014; Tomlinson et al., 2005). Studies on intergenerational PTSD have established a significant association between PTSD in parents and the incidence of PTSD in their children (Roberts et al., 2012; Yehuda et al., 2008) with maternal PTSD more strongly related to PTSD risk in offspring than paternal PTSD (Yehuda et al., 2008). Exposure to excessive production of glucocorticoids, as the result of maternal stress, reduces infant birth weight, which is in turn associated with later psychopathology. Evidence notwithstanding, there is still a dearth of information on the direct effect of antenatal and perinatal PTSD on infants in South African studies. A study on childhood trauma as a risk factor for depression and PTSD, refers to obstetric risks such as pre-term delivery, pre-eclampsia, poor neonatal health, stunted growth, and compromised development (Choi et al., 2015). In the same paper, reference is made to the fact that little is known about the prevalence and predictors of antenatal PTSD in South African women, and little is known about how to address and treat both antenatal depression and PTSD during pregnancy. In a review on common perinatal mental disorders (CPMDs), Fisher et al. (2012) remark on the abundance of studies in high-income countries with "high quality epidemiological, clinical, health service and health system evidence surrounding CPMDs" (p.145). Further, this is in "sharp contrast" to the lack of evidence about CPMDs in women in 80-90% of LMICs, with most countries having at most one study in the English-language literature (Fisher et al., 2012).

Despite statistical confirmation that many women experience mental disorders during their childbearing years, there are few South African studies on the impact of PTSD on pregnancy, and even fewer on the impact on infant health. The comorbidity of PTSD with substance use, panic disorder, eating disorders and depression in pregnant women plays a role in foetal outcomes (Gold & Marcus, 2008). These outcomes include preterm delivery (PTD) and low birthweight (LBW) which influence foetal and infant death, and birth complications. Stein (2014) identified an association between antenatal depression and intrauterine growth restriction in LMICs.

A discussion of the impact of CPMDs on the mother and infant would be incomplete without examining how this affects the mother-infant bond. A study on prematurity, maternal posttraumatic stress, and their consequences on the relationship between mother and infant, concluded that full term dyads are more likely to show balanced attachment patterns than preterm dyads (Forcada-Guex et al., 2011). Behavior characteristics of "Controlling" dyads (as opposed to "Cooperative" dyads) were found with prematurity. Forcada-Guex et al. claim that "a high concordance exists between mothers' representational models of their own attachment experiences and the quality of their infants' attachment, with maternal responsivity and sensitivity playing a major role in this construction…the impact of the premature birth on maternal emotional health may be more important than the prematurity itself." (p.80-81). It's not too much of a stretch to posit that the link between LBW, PTD, CPMDs and the high incidence of trauma in South Africa, indicates a powerful need for strong evidence-based interventions and programs to protect generations of children and mothers from repetitive patterns of trauma.

The World Health Organisation (WHO) mental health action plan for 2013-2020 (WHO, 2013) names yoga and meditation in their strategies for promotion and prevention in mental health: "Encourage the use of evidence-based traditional practices for promotion and prevention in mental health (such as yoga and meditation)." (p.29). The WHO Traditional Medicine Strategy report (2013) states that Traditional and Complementary Medicine (T&CM) is an often underestimated and important part of health care, found in almost all countries globally, and with an increasing demand for its services worldwide: "TM, of proven quality, safety, and efficacy, contributes to the goal of ensuring that all people have access to care." (p.7). WHO is currently formulating benchmarks for training in yoga and other indigenous knowledge systems.

Changes in the brain caused by traumatic experiences stop people exposed to trauma from connecting with their bodies, affecting interoception, a vital part of resilience to trauma (Steinwand, 2017). This study explores the effectiveness of African Kundalini Yoga as a T&CM for the treatment of posttraumatic stress symptoms in pregnancy, from the perspective of the participants. Researchers have found that yoga, and in particular deep breathing (the kind that naturally accompanies chanting and singing) and is contained in the breath practices of yoga and meditation, restores the individual's ability to connect with their body (Emerson, 2015; Steinwand, 2017). Associations between emotional disorders, autonomic nervous system response and vagal tone (such as heart rate variability), and the negative impact that trauma and chronic stress have on the structures of brain and body have been the focus of many research studies. The somatic aspect of trauma, an aspect that is echoed in the research of van der Kolk, Ogden, Siegel, Porges, Levine, and others interested in how trauma impacts the body, is revealed through the experiences of the study participants.

Women are more exposed to interpersonal trauma. They have twice the amount of risk of exposure compared to men and double the lifetime prevalence of PTSD (West et al., 2017). Lifetime prevalence of PTSD is between 1% and 9% globally among the general population (Gelaye et al., 2017). In the US National Comorbidity survey, women showed the highest prevalence of PTSD during their childbearing years, between the ages of fifteen and forty-four years (Ditlivsen & Elklit, 2010; Kessler, Sonnega, Bromet, Hughes & Nelson, 1995). PTSD symptoms are especially high during pregnancy, particularly close to delivery, and postpartum (the period immediately following delivery) (Muzik et al., 2016). Potential adverse outcomes for mother and infant makes pregnancy a critically important time for identifying disorders and referring women for assessment and treatment using a multidisciplinary approach (Paschetta et al., 2014). This research addresses a gap in the literature on the intersection between yoga and meditation, pregnancy, and PTSD.

Chapter Two: Literature Review

The literature review starts with an examination of the definitions of PTSD and complex PTSD. Conceptions of attachment theory and yoga therapy in the literature are explored. A review of the literature on the incidence of PTSD in South Africa follows, with a focus on the occurrence of maternal PTSD and cooccurring psychopathologies. Risk factors and resilience are reviewed, and a synopsis is made of studies that focus on the impact of PTSD on the body and brain. The impact of maternal PTSD during the antenatal period is under-researched (Choi et al., 2015) and thus literature on the impact of PTSD on infant health, and the attachment bond is also reviewed, in addition to the impact of PTSD on interpersonal relationships. Related research on the intergenerational transmission of PTSD is presented. A summary is made of the available literature on yoga therapy and PTSD, and yoga therapy and pregnancy.

2.1 Definitions

2.1.1 PTSD.

In the *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition* (DSM-5), PTSD appears in a new category called Trauma- and Stressor-Related Disorders (DSM-5 Criteria for PTSD, 2019, April 10). A preschool subtype has been added to the criterion for PTSD. The criteria below are applicable to children over 6 years, adolescents, and adults.

Criterion A: stressor (one required). The person was exposed to death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, in the following way(s): Direct exposure/Witnessing the trauma/Learning that a relative or close friend was exposed to a trauma/Indirect exposure to aversive details of the trauma, usually in the course of professional duties (e.g., first responders, medics).

Criterion B: intrusion symptoms (one required). The traumatic event is persistently re-experienced in the following way(s): Unwanted upsetting memories/Nightmares/Flashbacks/Emotional distress after exposure to traumatic reminders/Physical reactivity after exposure to traumatic reminders.

Criterion C: avoidance (one required). Avoidance of trauma-related stimuli after the trauma, in the following way(s): Trauma-related thoughts or feelings/Trauma-related external reminders.

Criterion D: negative alterations in cognitions and mood (two required). Negative thoughts or feelings that began or worsened after the trauma, in the following way(s): Inability to recall key features of the trauma/Overly negative thoughts and assumptions about oneself or the world/Exaggerated blame of self or others for causing the trauma/Negative affect/Decreased interest in activities/Feeling isolated/Difficulty experiencing positive affect.

Criterion E: alterations in arousal and reactivity. Trauma-related arousal and reactivity that began or worsened after the trauma, in the following way(s): Irritability or aggression/Risky or destructive behaviour/Hypervigilance/Heightened startle reaction/Difficulty concentrating/Difficulty sleeping.

Criterion F: duration (required). Symptoms last for more than 1 month.

Criterion G: functional significance (required). Symptoms create distress or functional impairment (e.g., social, occupational).

Criterion H: exclusion (required). Symptoms are not due to medication, substance use, or other illness.

Specifications. Dissociative Specification**.** In addition to meeting criteria for diagnosis, an individual experiences high levels of either of the following in reaction to trauma-related stimuli:

- Depersonalization. Experience of being an outside observer of or detached from oneself (e.g., feeling as if "this is not happening to me" or one were in a dream).
- Derealization. Experience of unreality, distance, or distortion (e.g., "things are not real").

Delayed Specification. Full diagnostic criteria are not met until at least six months after the trauma(s), although onset of symptoms may occur immediately.

2.1.2. Complex PTSD.

Complex PTSD (C-PTSD) is not currently acknowledged in the DSM-5 as a separate condition to PTSD, however C-PTSD may be diagnosed by some mental health professionals if an individual has been subjected to prolonged or repeated trauma over months or years (Leonard, 2018, August 28). Several psychological complications accompany PTSD although they are not recognised as part of the diagnosis (van der Kolk, 2002). These include depression, self-hatred, intimacy problems, self-destructive behaviours, dissociation, and the inability to experience pleasurable activity. These are often called comorbid conditions, instead of being acknowledged as part of a spectrum of trauma-related issues which develop

as a result of several factors, such as developmental age at the time the trauma occurred, the relationship between trauma victim and agent of trauma, the time period over which the trauma occurred, and whether or not there was social support available at the time of trauma.

Most people seeking treatment for trauma have histories of multiple traumas starting in childhood (van der Kolk, 2001). A high percentage of trauma patients report that chronic feelings of shame, self-blame and negative self-image, symptoms of dissociation and depersonalisation, aggression against self and others and inability to control or self-regulate emotions, rather than the characteristic symptoms of PTSD, make their lives intolerable. This collection of conditions is also called Disorders of Extreme Stress Not Otherwise Specified (DESNOS).

The WHO International Classification of Diseases, 11th version (ICD-11) (2018) has proposed that PTSD and C-PTSD are related diagnoses (Cloitre, Garvert, Brewin, Bryant & Maercker, 2013; World Health Organization, 2019, October 11). The distinguishing characteristics of C-PTSD are in three areas of self-regulation: affective dysregulation, negative self-concept, and interpersonal difficulties, in addition to the usual symptom profile of PTSD. Herman (1992) suggests that C-PTSD may coexist with PTSD but extends beyond it and "is characterised by a pleomorphic symptom picture, enduring personality changes, and high risk for repeated harm, either self-inflicted or at the hands of others" (p.387). The need for an expanded diagnosis is reflected in evidence that people with C-PTSD, or DESNOS, are not only resistant to traditional forms of treatment for PTSD but may actually be harmed by it (van der Kolk, 2002). Two such forms of conventional treatment, prolonged exposure and cognitive restructuring, were found to achieve a higher attrition rate than what van der Kolk calls a "present-centred therapy" (2002, p. 135), which excludes both forms of conventional treatment for PTSD.

With the presence of early trauma, there is increased risk of patterns of early attachment dysfunction. Further, current literature shows that mothers who have attachment dysfunction are at risk for creating dysfunctional patterns of attachment with their infants. We turn to an examination of attachment theory in the following section.

2.2. Attachment Theory

"Attachment is when a young child uses a caregiver as a secure base from which to explore and, when necessary, as a haven of safety and source of comfort. This attachment is based on early experiences with caregivers' extent of responsiveness with the child" (Stein et al.,

2014). Attachment theory refers to the natural inclination in humans to form close affective bonds to specific people, seen in the newborn, and continuing throughout life into old age (Bowlby, 1988). Infants and children look to parents or caregivers for safety, security, and care, and in this way attachment bonds are established. The initial communication between mother and baby is nonverbal through gesture and expression, and although speech is later added, this nonverbal communication continues as a prominent aspect of close relationships throughout life.

Mary Ainsworth, a student of John Bowlby, developed the 'strange situation' procedure, an experiment designed to observe the different forms of attachment styles and behaviours displayed between mothers and their one- to two-year-old's (McLeod, 2008). Using these experiments, Ainsworth (1970) identified three main attachment styles, secure (type B), insecure avoidant (type A) and insecure ambivalent/resistant (type C) and concluded that they came about through early mother-infant exchanges. Main and Solomon (1990) later identified a fourth insecure attachment style which is known as disorganised attachment.

Bowlby's theory, essentially a regulatory theory, spans biological and psychological functioning, creating capacity for interpersonal relating (Schore, 2000). Early environmental events, in particular the mother-child bond, shape the infant brain, and infant, child, and adolescent development depends on this early shaping, inseparable from the mother-child bond, and beginning in the womb. When the sensitively attuned mother empathically mirrors her infant, successfully regulating their internal state of autonomic nervous system (emotional) arousal through facial expressions, touch, and prosody, she creates an environment whereby mother and infant behaviours become attuned to one another (Schore, 2010). The secure attachment that is the result of the attunement is based on the capacity of the developing child to regulate their own emotions, having successfully learned this from the early bond with the mother (Carleton, 2009), and resilience to stress is the optimal outcome of such secure attachment (Schore, 2010). Research on brain development and early attachment processes, and the ability to form and maintain intimate relationships throughout life, has shown that the infant brain develops in relationship with its caregivers, with the right brain in particular associated with empathic perception of the emotional states of other human beings, and emotional self-regulation (Schore, 2000). When there are ruptures in the attachment bonding processes, when mothers are mis-attuned to their infants, the autonomic system of the infant is compromised, and the right brain capacity to develop emotional self-regulation is impaired, with negative developmental impact on resilience to stress and an

impaired capacity to bond in relationships lasting into adulthood (Carleton, 2009; Schore, 2001; Schore, 2010; Swain, Lorberbaum, Kose & Strathearn, 2007).

Sensitively attuned mothers are important for healthy attachment behaviours in infants and, as yoga and meditation are popularly understood to have a positive impact on the autonomic nervous system, possibly increasing healthy attachment behaviours, an examination of yoga therapy in the literature follows.

2.3. Yoga Therapy

Yoga therapy is believed to be a modern innovation because the term was not used in historical texts (Khalsa, Cohen, McCall, Telles & Ornish, 2016). The historical goal of yoga was to overcome the limitations of the ego and achieve transcendent states; it was a spiritual methodology for freedom from suffering, not a way to be more physically healthy. Yet Patanjali, the "codifier of yoga science" (Swami Rama in Bharati, 1986, p. xi) listed disease as an obstacle to spiritual practice, so it seems probable that yogic tools (chanting, breathwork, postures, meditation practices) were used to neutralise all obstacles to spiritual elevation (Khalsa, Hickey-Schultz, Cohen, Steiner & Cope, 2012). Sovik's paper on breath (2000) references Aranya (1983): "Since ancient times yoga has been practiced both for averting future pain (*dukham anagatam*) and as an aid for recovering health – that is, it is preventive as well as restorative" (p. 492).

Contemporary yoga therapists describe yoga therapy as a combination of therapeutic practices including breathing, body postures, and meditation, and some philosophical training which, with lifestyle changes including diet, sleep and hygiene habits, forms a beneficial system for mind, body and spiritual health (Payne, Gold & Goldman, 2015).

Increasing numbers of adults are seeking out yoga, meditation and breath work as the most common forms of complementary and alternative medicine (CAM) to treat specific ailments, relieve symptoms and improve their general health and quality of life (Ross, Williams, Pappas-Sandonas, Touchton-Leonard & Fogel, 2015). However, not all yoga is appropriate for people with health conditions, particularly the forms of yoga that have become popular in the West, with their emphasis on performance and body fitness that brings with it the possibility of injury (Khalsa et al., 2016).

Yoga therapists place emphasis on the precise indicators of the troubling condition and establish protocols for their clients to assist in the management of their symptoms. The focus

is on overcoming the challenges that the condition presents, with the goal of gaining autonomy, rather than on precision, as it is in a yoga class (Yoga Therapy Versus Yoga Class, 2015, April 14).

With yoga therapy, the practices are changed and modified to suit individual needs. However, yoga therapy can also be practiced in group situations where participants share similar symptomatologies and want to achieve similar results (Khalsa et al., 2016).). In group yoga therapy situations, the level of assessment and treatment plan is less tailored to each participant than in individual situations, however, the therapist or experienced teacher still needs to know how to modify what is taught to suit the level of ability, pace, and capacity of each participant within the group. Standardised yoga protocols form the majority of almost all scientific studies, with funders generally refusing to fund anything else, even though most yoga therapists consider standardised methods to be less effective than customised protocols (Khalsa et al., 2016).

Yoga therapy is designed for a number of different purposes including emotional, physical, and psychological symptom improvement (Bussing, Michalsen, Khalsa, Telles & Sherman, 2012; Casey et al., 2018; Franzblau, Echevarria, Smith & Van Cantfort, 2013; Khalsa et al., 2016; Kohn, Persson Lundholm, Bryngelsson, Anderzen-Carlsson & Westerdahl, 2013; Kunjeshwori Devi, Chansauria & Udupa, 1986; Lee, Moon & Kim, 2014; McCall, Ward, Roberts & Heneghan, 2013; Melville, Chang, Colagiuri, Marshall & Cheema, 2012; Nayak & Shankar, 2004; Rhodes, 2014; Shapiro et al., 2018; West, 2011;), rehabilitation in the case of physical injuries (Khalsa et al., 2016; Schmid, Miller, Van Puymbroeck & Schalk, 2015), and a strong case can be made for yoga therapy to be used as preventative medicine (Cramer, Park, Steel, Gangadhar & Pilkington, 2017; Khalsa et al., 2016).

Research on yoga therapy in recent years has resulted in the conception of a peer-reviewed, professional forum, and scholarly articles in databases such as PubMed, boosting the status and popularity of yoga research (Kepner, 2015) and research is increasingly focusing on clinical applications of yoga (Salmon, Lush, Jablonski & Sephton, 2009). Discussion and debate on contemporary issues of yoga therapy has created the possibility of its inclusion in the mainstream pursuit and establishment of knowledge. The global practice of yoga has the potential to transform the physical and psychological wellbeing of people everywhere and substantially lessen the financial burden of healthcare systems (Khalsa & Mason, 2015). This is reflected in the findings of a study on an integrated medicine yoga program that showed

substantial reductions in hospital costs and patient medication for anxiety, nausea, pain, and sleep (Friedman, Kligler, Hommel & Merrell, 2012). Well-designed RCTs on clinical applications of yoga have shown the impact of yoga on emotions, with a significant improvement seen in symptoms of depression, anxiety, fatigue, sleep quality, quality of life and wellbeing in cancer patients, indicating the usefulness of a yoga program for patients undergoing difficult and tiring treatment procedures (Khalsa et al., 2016).

Van der Kolk (2006) presents a compelling case for yoga in the treatment of trauma. Physical movement is prewired as a priority into the nervous system. It slows down perception of the body for the practitioner and allows for the development of a perceptible interoceptive relationship with the body, which has a powerful impact on the behavioural patterns commonly related with clinical pathologies. Body awareness is identified as the ability to recognise subtle physical cues and is used in stress reduction programs to enable individuals to become aware of and intercede when tension-related body cues are recognised (Baas, Beery, Allen, Wizer & Wagoner, 2004) and to facilitate self-knowledge, with the concomitant capacity to mediate with negative thoughts and feelings so as to alter patterns of depressive cognition (Watkins & Teasdale, 2004).

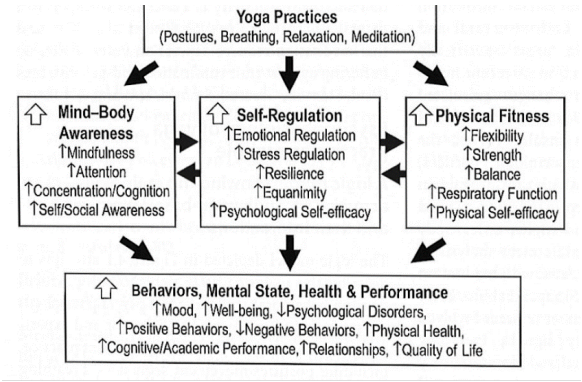
However, much of the research on yoga conducted in India in the early 1920s was greatly disadvantaged by methodological weaknesses, limiting clinical usefulness. Even Western research until recently did not use RCTs as a matter of course. Small sample sizes, lack of statistically significant results, confounding variables blurring results, lack of standardisation of yoga protocols being tested, and a host of other complicating factors rendered research results questionable (Salmon et al., 2009). Despite this, indications of the clinical usefulness of yoga is clearly outlined even in the messiest of studies which should have prompted a much earlier and more rigorous investigation into why it works as well as it does.

The following diagram symbolises the impacts of the various practices utilised in yoga, that is, postures, breathing, relaxation, and meditation. These impact on mind-body awareness (affecting concentration, cognition, and self and social awareness), promote the regulation of emotions and stress which assist in creating resilience, equanimity, and psychological self-efficacy, enhance physical fitness through creating flexibility, bodily strength, and balance, and improve respiratory function and physical self-efficacy. This has an overall enhancing effect on mood, sense of wellbeing, positive behaviours, physical health, cognitive and academic performance, relationships and quality of life, and a diminishing effect on

psychological disorders and negative behaviours. As indicated in the diagram, these states are mutually reinforcing and work together to improve functioning.

Figure 1

The Skills and Transformations Occuring on a Psychophysiological Level due to the Practice of Yoga (Khalsa et al., 2016, p. 58)



Yoga therapy is still in its infancy globally, and more so in South Africa. Given the international academic and professional interest in the use of yoga and meditation with trauma, we turn to a consideration of trauma in South Africa and the inherent health risks implied for South African women before considering the research on the use of yoga and meditation with trauma.

2.4. PTSD in South Africa

Trauma presents a public health crisis in South Africa, undermining potential advances in health care and prevention (Wyatt et al., 2017). South Africa is characterised by high rates of crime involving murder, robbery, and assault, including sexual assault (Williams et al., 2007). South African women and children, vulnerable sectors of society, bear the brunt of the culture of violence, born in the state-sponsored violence of the Apartheid regime and the decades-long struggle for liberation, and sustained in interpersonal violence.

Gender based violence (GBV) and intimate partner violence (IPV) is a risk factor for mental health problems for women in low and middle income countries (LMICs), particularly when combined with social determinants (Choi et al., 2015; WHO, 2008). A Gender Links survey conducted in the four provinces of Limpopo, Gauteng, Western Cape and Kwa-Zulu Natal found that all 5621 South Africans participants (2800 women and 2821 men) had experienced some form of violence (emotional, physical, economic or sexual), at least once in their

lifetimes, both within and outside of their intimate relationships (Gender Links, 2015). Unlike police data that relies on reported cases, the Gender Links survey used self-reported behaviour and experiences obtained through in-depth interviews. An average of 50% of the male respondents admitted to committing violent acts against women at least once in their lives, and 7% to 9% had engaged in multiple rapes. The South African Human Rights Commission (SAHRC) report (2002) outlines the situation for girl children: "…on a daily basis in schools across the nation, South African girls of every race and economic class encounter sexual violence and harassment at school…" (p.8).

The South Africa Stress and Health (SASH) study (2003-2004) surveyed 4351 adult South Africans of all ages, races, ethnicities, and socio-demographic variables, using six South African languages, making this survey highly representative of the general population (Myer et al., 2008; Stein et al., 2009; Williams et al., 2007). SASH results confirmed that almost 75% of the sample had experienced at least one trauma during their lives, and 9% experienced upwards of six traumatic events (Stein et al., 2009). The most prevalent traumatic event across the sample, at 43%, was the unexpected death of a loved one. Witnessing trauma (27.9%), being a victim of crime (25.1%), and partner violence (24.3) also had relatively high frequencies. The least reported type of trauma was sexual assault at 3.5%. Given the high incidence of rape, GBV, and IPV in South Africa, this low percentage may reflect under-reporting. Partner violence, child abuse, criminal victimisation, disasters, threats to life and trauma of loved ones were related to high levels of psychological distress, with risk increasing sharply with numbers of traumatic events experienced.

Information from the South African Police Services (South African Police Service, 2017-2018), Gender Links (2015), Statistics South Africa (Orkin, 2000), and the Medical Research Council (Jewkes, Sikweyiya, Morrell & Dunkle, 2009) indicates that the official reporting of rape is 25% to 50% of the actual occurrences. South African Police Services annual crime report (2017-2018) states that 51, 895 crimes of a sexual nature were committed in 2015/16, which means that the actual figures could be up to double that amount. Sexual assault within intimate relationships may be one of the reasons for underreporting (Williams et al., 2007). South Africa needs culturally specific approaches to fully understand cultural beliefs about mental illness, rape, and trauma (Wyatt et al., 2017). A culturally specific measure for PTSD, developed by Dr Madigoe, and administered together with a Western developed measure to 100 Zulu-speaking adults seeking treatment in KZN, increased the reporting of traumatic events by 28%.

A recent study investigated the course of depression and PTSD among women from three different provinces (KZN, Western Cape, and Limpopo) six months after being raped (Wyatt et al., 2018). Stark differences were discovered among the different regions linked to SES. Women from KZN were found to experience depression seven times more than women from the other provinces, and unmarried women in KZN had six times greater rates of depression and PTSD than married or cohabiting women in the same province.

Over 30% of South African women report a history of childhood sexual abuse (Choi et al., 2015). In a study on children and adolescents in the Free State province, 4% of the sample group of 1229 children from two to eighteen years old, most of whom were female, were diagnosed with PTSD, and 22% were diagnosed with MDD (Calitz et al., 2014). The link between childhood abuse and poor mental and physical health outcomes is well known and must be carefully considered for its impact during pregnancy. This alarming picture of childhood abuse passing through generations of women and children highlights the need for research on the intergenerational transmission of PTSD and makes pregnancy a critically important time for identifying disorders and referring women for assessment and treatment using a multidisciplinary approach (Paschetta et al., 2014).

Trauma in a South African context must consider that the understanding and philosophy of PTSD comes from the global North, concerning both concepts and therapeutic practices, and these occupy the privileged stance that the world is a reasonable and just place, and therapy returns the trauma survivor to their place in that world (Horn, 2020). PTSD is seen as a clinical condition rather than a social one. Risk factors for PTSD in an African context need to include a wider understanding of the root causes of trauma as embedded in the social context in which women and children live in Africa, where "the world *itself* is the stressor" (p. 90).

2.4.1. PTSD and Pregnancy.

In general, perinatal women tend to be younger than the general population (Seng et al., 2010). The median age in South Africa for nulliparous women is twenty-one years for all population groups, and younger for women with lower level education and women living in rural areas (Statistics South Africa, Census 2011). The mean age of trauma exposure for adolescents in South Africa was found in several studies to be sixteen years of age (Calitz et al., 2014; Suliman et al., 2005). The intersection of the mean age for trauma exposure with the median age for first births means that the brief time period between sixteen years and

twenty-one years (or younger) gives less time for assessment and treatment of possible PTSD and concurrent disorders before the first child is born (even if that were freely available in South African public health systems). Morland et al. (2007) make a similar statement in their study on perinatal PTSD in Hawaii, "Exposure to trauma peaks between the ages of 16 and 20 years, suggesting that trauma and subsequent PTSD often occur before childbearing" (p.304).

A 2011 census on fertility in South Africa (Statistics South Africa, Census 2011), states that 13.9% of girls between fifteen and nineteen years of age have already given birth to their first child, and an even more disturbing 7.9% of twelve- to fourteen-year-olds, raising the spectre of combined childhood sexual abuse and early pregnancies to the level of a public health crisis.

Reproductive and general health for early first births may be negatively affected with obstructed labour, fatal postnatal haemorrhaging and socially disruptive sequela of childbirth such as vaginal fistula (Statistics South Africa, Census 2011), possibly giving rise to PTSD from the experience of a traumatic birth (Lev-Wiesel et al., 2009), particularly when there is early developmental trauma. The foetus is at risk for negative physical outcomes associated with maternal PTSD, such as low birth weight (Gold & Marcus, 2008; Grote et al., 2010; Muzik & Borovska, 2010; O'Brien et al., 2009; Rogal et al., 2007; Seng et al., 2011), preterm delivery (Gold & Marcus, 2008; Grote et al., 2010; Muzik & Borovska, 2010; Seng et al., 2011; Stein et al., 2014; Yonkers et al., 2014) and intrauterine growth retardation (Grote et al., 2010; Seckl, 2004; Seckl & Meaney, 2006; Stein et al., 2014). Early first births also have social and economic consequences by directly impacting on level of education achieved and thus on employability and SES (Statistics South Africa, Census 2011). Lower levels of education, employability and SES are associated with less competent parenting and fewer opportunities available to the children of teenagers (Statistics South Africa, Census 2011), increasing their vulnerability and the probability of being exposed to childhood abuse, thus continuing the vicious cycle of abuse (Lev-Wiesel et al., 2009). The physical consequences of childhood sexual abuse and early pregnancies are accompanied by the mental health risk posed by the psychiatric disorders known to accompany childhood sexual abuse and possible traumatic childbirth, impacting even more on public health systems (van der Walt et al., 2014).

PTSD in pregnancy can co-occur with related mental health issues like eating disorders, depression, substance use and panic disorder, and these may impact on foetal wellbeing (Gold & Marcus, 2008). When PTSD is the result of childhood sexual abuse or abuse within the family, previous miscarriage, previous traumatic birth or when the current pregnancy is the result of a sexual assault with accompanying symptoms of PTSD, vulnerability to active PTSD may be increased (Seng et al., 2010). Higher levels of symptoms for PTSD manifest in pregnancy (6-8%) than among general populations of women who meet the criteria for PTSD (4-5%). Among the possible causes for this are the natural psychophysical changes in pregnancy that may affect the experience of PTSD symptoms and trigger active PTSD. The experience of increased heart and breath rates, nausea and shortness of breath in women who are pregnant for the first time may be mistaken as anxiety and trigger the sequences of hyperarousal such as hypervigilance, re-experiencing, and avoidance or numbing. Preparing for motherhood and feeling a growing attachment to the foetus is potentially triggering, especially if there is the presence of previous interpersonal trauma, as are the physical aspects of pregnancy such as feeling foetal movement and having sensitive breasts. Labour, especially when there are medical interventions, can prompt feelings of helplessness, vulnerability, and powerlessness, which in turn can trigger PTSD symptoms.

In South Africa, PTSD may provide a critical missing link when considering adverse health in pregnancy, poor birth outcomes, and complications in labour, providing more information via related high-risk behaviours and changes in the neuroendocrine system (Morland et al., 2007). PTSD is associated with the dysregulation of cortisol and other neuroendocrine transmitters such as oxytocin and vasopressin which may incline perinatal women to difficulties with birthing.

Changes in the hypothalamic-pituitary-adrenal (HPA) axis (Koen et al., 2017), and the hypothalamic-pituitary-ovarian (HPO) axis are associated with a normal pregnancy (Seng et al., 2010). Increased progesterone and oestrogen from HPO axis changes (affecting mood and cognition) and increased cortisol from HPA axis changes, could affect the incidence and intensity of traumatic memories, and impact on mood, sleep, concentration, motivation and social cognition (Seng et al., 2010). This can trigger active PTSD during pregnancy in the presence of pre-existing trauma exposure.

2.4.1.1. PTSD and Co-Occurring Conditions.

There is strong evidence for a link between major depressive disorder (MDD) and PTSD (Bleich et al., 1997; Breslau et al., 2000; Stein & Kennedy, 2001). The likelihood of a major depressive episode in pregnancy is five times greater in pregnant women with PTSD than in those without PTSD (Cook et al., 2004). Compelling research indicates how MDD negatively affects foetal outcomes; also well-documented is the extensive occurrence and negative effect of maternal depression during pregnancy (Battle & Salisbury, 2010; Beck, 1998; Clayton, 2004; Grote et al., 2010; McFarland et al., 2011). In a large meta-analysis with data from several high-grade research studies it was found that up to 18% of pregnant women experienced depressed mood (Gavin et al., 2005). In addition to this, PTSD is linked to a greater chance of the use of substances like marijuana, alcohol and tobacco during pregnancy and may lead to an increased risk of harmful activities including unsafe sex (Morland et al., 2007). The increased risk of preterm birth, low birth weight, and intrauterine growth restriction has been linked to symptoms of depression in pregnancy in some but not all studies (Grote et al., 2010).

While PTSD may be the most common condition to follow on from exposure to traumatic stress, co-occurring conditions such as anxiety disorders, substance-use disorders, and suicidality, in addition to depression, are frequent companions to PTSD (Breslau et al., 2000; Galatzer-Levy, Nickerson, Litz & Marmar, 2013; Green, Lindy, Grace & Leonard, 1992; Hruska, Irish, Pacella, Sledjeski & Delahanty, 2104; Keane & Kaloupek, 1997; Muller et al., 2014; Sherman, Gress Smith, Straits-Troster & Larsen, 2016; Solomon et al., 1991; Spinhoven, Penninx, van Hemert, de Rooij & Elzinga, 2014; van der Walt et al., 2014; Zlotnick et al., 1999). According to the US National Comorbidity Survey, more than 80% of people between fifteen and fifty-four years of age who have PTSD will develop a serious co-occurring disorder in their lives (van der Walt et al., 2014). Comorbid PTSD with other anxiety and mood disorders increases the risk of suicidal behaviour. GBV including rape and sexual abuse is linked with a greater co-occurrence of psychiatric disorders, pain disorders, sleep disorders and other anxiety disorders (van der Walt et al., 2014).

Anxiety and depression are associated with the reporting of physical symptoms, and this may explain why people with comorbid PTSD often report somatic pain (Van Ommeren et al., 2002). There is strong evidence for the association between traumatic stress and somatic complaints (Herman, 1992; McFarlane, Atchison, Rafalowicz & Papay, 1994; Nugent, Goldberg & Uddin, 2016; Sherman et al., 2016; Van Ommeren et al., 2002) and the neurobiological alterations that accompany trauma, including the hyperarousal of the

autonomic nervous system (Blechert, Michael, Grossman, Lajtman & Wilhelm, 2008; Cohen et al., 2000; Holzel et al., 2010; Jennings, 2013; Sapolsky, 2000).

In a study examining the relationships between the severity of PTSD, depression and physical health symptoms, depression was linked with measures of subjective health such as fatigue and loss of interest in things previously enjoyed, and an increase in perceptions of pain and restricted physical capacity, and other somatic complaints linked with the physical sensations of hyperarousal and re-experiencing such as muscle tension, sweating, shaking, and racing heart (Rytwinski et al., 2014). Depression was found to increase perceptions of negative subjective health with increased severity of PTSD symptoms such as hyperarousal and re-experiencing, but not avoidance, which does not have the same impact on the physical body. PTSD is a contributing risk factor for depression and anxiety, and anxiety and depression are risk factors for PTSD (Spinhoven et al., 2014). The symptoms of all three conditions overlap with each other and share common risk factors, particularly childhood trauma.

Individuals who report childhood trauma are at greater risk of developing PTSD as adults and are more likely to have subsequent exposure to trauma (Spinhoven et al., 2014; Zlotnick et al., 1999). An equally strong connection exists between childhood trauma and anxiety and mood disorders. Recent research on childhood emotional abuse confirms that it is a highly significant risk factor for PTSD, giving rise to mental disorders including depression and suicidality. The Netherlands Study of Depression and Anxiety (NESDA) (Spinhoven et al., 2014) found that 92.8% of their participant sample with anxiety and depression reported a potentially traumatic event, compared to 80.7% of the general population in the Netherlands. 22.6% reported a traumatic event that occurred before the age of sixteen, while 26.2% of the sample reported the traumatic incident as being of a sexual nature. In this study childhood sexual and physical abuse were the key risk factors for the comorbidity of anxiety and depression with PTSD, independent of gender.

Panic attacks in PTSD are distinguished from the panic attacks observed in panic disorder by an accompanying tangible fear linked with memories of the traumatic event (Joscelyne, McLean, Drobny & Bryant, 2012). Posttraumatic panic is experienced by 90% of rape survivors, and 53% of MVA victims and survivors of non-sexual attacks, and research shows that panic experienced during a traumatic event is linked with outcomes in mental health. Studies on fear-circuitry disorders reveal the pairing of benign physical stimuli with a traumatic experience, creating a conditioned stimulus. This response is distinguished by

extreme amygdala reactivity and an inability in the medial prefrontal cortex to regulate the amygdala response. With PTSD, later exposure to the conditioned stimuli happens when memories of the trauma are triggered. The panic and excessive arousal of amygdala response experienced at the time of the trauma become part of the conditioned stimuli, and somatic sensations can trigger the re-experiencing of the original symptoms. The original fears of death and injury experienced during the traumatic event become coupled with benign bodily sensations such as a shortness of breath, minor chest pains or faintness. Models of posttraumatic panic propose that the bodily cues linked with the panic experienced in the traumatic event become associated with internal and external cues related to the trauma and these triggers provoke later panic attacks, which create new trauma-related associations. Simple somatic sensations such as neck tension can stimulate trauma recollection systems, catastrophizing thoughts, associations that may stem from cultural beliefs, or interoceptive conditioning such as described above in the fear-circuitry models. If any of these networks are triggered and result in mounting anxiety, a panic attack is likely to occur (Cougle, Feldner, Keough, Hawkins & Fitch, 2009).

Various factors that place people at risk for developing PTSD are considered in the next section. These include wider environmental factors, biological background, and proximal life events such as childhood abuse, previous traumatic birth, intimate partner violence, motor vehicle accidents and the unexpected death of a loved one.

2.5. Risk Factors for Developing PTSD

Dohrenwend's model (2000) provides the framework for the review of risk factors for developing PTSD. The wider environment, considerations of biological background, and life events are reviewed. Personal predispositions and ongoing situations are considered in the context of the discussion in this paper.

2.5.1 Wider Environment.

The relationship between SES and psychiatric disorders indicates that environmental hardship after the occurrence of a traumatic event, and the number and importance of normal goal-directed activities adversely affected in an individual's ongoing situation, will determine the likelihood of a psychiatric disorder, including PTSD, major depression and substance abuse disorders (Dohrenwend, 2000). Factors impacting on the perception of uncontrollable adverse changes are gender, SES in urban societies and ethnicity/race. South Africa's history of apartheid means the intersection of race with poverty and socioeconomic disadvantage denies

Dohrenwend's claim that SES, unlike race, can be at least partially affected by behaviour on the part of the individual. Three out of five Black South Africans experience poverty, which firmly links race and socioeconomic disadvantage and disavows the capacity to change the situation by behaviour alone (South African Human Rights Commission, 2013-2017). Even middle-class Black South Africans, such as some of the participants in the study, will have their mental health more severely challenged because of "Black Tax". Individual wealth is seen as a contradiction of African cultural values where wealth is historically shared communally with the immediate and extended family. True middle-class financial freedom is unattainable for "Black working metro South Africans" (Money Marketing, 2019, June 11) making economic hardship a constant in the lives of Black South Africans.

The emotional wellbeing and mental health of women in South Africa is intimately tied in with issues of power: patriarchal power, economic power and other power relations sanction an environment that violates women. Hope Chigudu, Organisational development specialist, articulates how this is tied in with trauma: "At the centre of trauma are issues of power. Power as it is exercised over us as women; the power that we have or don't have; power as defined by our context, our culture, our traditions. We need to take a feminist approach so as to be able to understand all these different elements that are connected with trauma." (AIR for Africa, 2015, March 8). Juvenal Balegamire, clinical psychologist at Panzi Hospital in the Democratic Republic of Congo (DRC), works daily with women facing exceptional brutality and violation, and has this to say about trauma and the wider environment which acts as a stressor for women: "The problem is not only sexual violation, the trauma is poverty, unemployment, traumatised families and communities, insecurity. When you deal with one issue it doesn't mean you are stabilising them because they have other traumatic issues, which trigger their traumatic experience." (Horn, 2020, p.90). South African women of all races, living in the wider environment of GBV and oppression, are to greater and lesser degrees subject to exposure to being triggered into trauma.

2.5.2. Biological Background.

Epigenetics examines the impact of traumatic events such as childhood abuse on constituents of the stress response, such as the hypothalamic pituitary adrenal axis (HPA) and glucocorticoid receptor, and how epigenetic mechanisms result in such impacts becoming mental and physical disorders (Murgatroyd, Wu, Bockmuhl & Spengler, 2010; Nugent et al., 2016; Yehuda et al., 2014). Evidence indicates that children who experience abuse in

childhood are at greater risk for developing PTSD after traumas in later life, due to modifications in the HPA stress response from childhood abuse. Epigenetic modifications are of interest as risk factors for psychopathology due to their link with external experiences.

The nature versus nurture debate has evolved to acknowledging their interdependence, with information from the environment shaping how genetic material is used (Murgatroyd et al., 2010; University of Southampton, 2014, April 28). During critical periods in pre- and postnatal development, stress can cause "permanent structural and regulatory changes" (Murgatroyd et al., 2010, p.195) that affect foetal and infant predisposition and susceptibility to possible lifelong mental and physical disease. Evidence of the intergenerational transmission of PTSD symptoms (Debiec & Sullivan, 2014; Roberts et al., 2012; Stein, Jang, Taylor, Vernon, & Livesley, 2002; Yehuda et al., 1998; Yehuda et al., 2008), in particular maternal PTSD (Yehuda et al., 2008), places an increased emphasis on pregnancy as a time for unlinking the chain of intergenerational transmission through treatment programs that decrease PTSD symptoms.

In an African context, with the culture of *ubuntu* that emphasises inter-dependence and the collective, the treatment of trauma must consider the connections to family, community and ancestors to be relevant and applicable (Horn, 2020).

2.5.3. Traumatic events.

Life events range from the more extreme, such as natural disasters and war to more "usual" events such as child abuse, rape, or a car accident. The latter can still be experienced as life threatening and have many of the characteristics of the extreme events in their impact on functioning and the capacity to carry on life as normal (Dohrenwend, 2000).

2.5.3.1. Childhood abuse. The Adverse Childhood Experiences (ACE) study found that multiple stressors in childhood including childhood sexual abuse, childhood emotional abuse, and childhood physical abuse, exposure to intimate partner violence (IPV), substance abuse in the household, parental separation or divorce, suicide attempts and the incarceration of a member of the household were linked with adult risk of depression, suicide attempts, high risk sexual behaviour with experience of STDs, illicit drug use, alcoholism, injecting illicit drugs and cigarette smoking (Felitti et al., 1998; Menard, Bandeen-Roche & Chilcoat, 2004). The more family level stressors people were exposed to in childhood, the higher the risk of negative health behaviours and disease in adulthood such as prevalence and risk for alcoholism, illicit drug use and injection of illicit drugs, multiple sexual partners,

obesity, increased cigarette smoking, depressed mood and suicide attempts (Felitti et al., 1998). Most participants in the ACE study who experienced one type of childhood abuse also experienced at least one other type.

Childhood abuse is tragically common in South Africa; it negatively affects perinatal mental health regardless of whether there has been subsequent trauma (Choi et al., 2015). Stressful memories can occur for the mother during her pregnancy, where the traumatic events of childhood can feel closer than at other times, and trigger symptoms of PTSD and depression. A history of child abuse prejudices parenting ability to influence self-regulation in their infants thus exposing the infant to the possibility of behavioural and emotional reactivity in later years (Martinez-Torteya et al., 2014). The cycle of repeating abuse where mothers with PTSD are unable to sufficiently care for their infants predisposes the infants to developing PTSD themselves in later years and ensuring the cycle continues.

In LMICs, where the context is rife with additional stressors such as poverty and IPV, women are at increased risk of turning to maladaptive, emotion-focused, avoidant and passive coping mechanisms such as self-blame and substance use, which worsen their mental health symptoms (Choi et al., 2015), and increase the likelihood of perpetuating the cycle of violence through inability to parent their infants sufficiently well (Seng et al., 2013). Abuse in childhood increases the risk of PTSD during pregnancy twelve-fold, and is linked with antenatal depression, and comorbid PTSD and depression. Women who had experienced childhood abuse were found to have more lifetime exposure to further trauma not linked to abusive relationships, had greater incidence of prior PTSD and MDD, reported a poorer quality of life, and reported having symptoms of dissociation during labour.

2.5.3.2. Traumatic birth. A difficult birth or a birth where the mother fears for her baby's life or possible injury to the baby can result in PTSD for the mother (Yildiz, Ayers & Phillips, 2017). If there is a history of previous trauma with PTSD symptoms, the physical processes involved in pregnancy and birthing can retrigger PTSD. In a study to verify the risk factors in pregnancy for developing PTSD one month after giving birth, evidence was found that the presence of high-trait anxiety, low capacity to cope with stress and perception of low levels of social support influenced the development of PTSD symptoms (Soderquist, Wijma, Thorbert & Wijma, 2009). For women who develop PTSD following birth, the perception of the level of support received during birth has a more pronounced effect on the development of PTSD symptoms than stressful events happening during birth (Ford & Ayers, 2009). Todd

(2013) says that as many as one in three women describe their births as traumatic, and consequently develop symptoms of posttraumatic stress. Even when medical staff perceive a birth as routine, the experience of the mother could be different due to a previous traumatic birth, or any prior trauma, and feelings of fear and anxiety could be influencing perception of the current experience. Czarnocka and Slade (2000) found prevalence for PTSD symptoms after labour to be between 3% and 24%. Various factors such as perceived low levels of support, self-blame or blame of others and experiencing low levels of control during the birth were related to experiencing PTSD symptoms afterwards. The research indicates a clear need for attention to previous mental health difficulties to prevent re-triggering PTSD symptoms, and to consider the impact of labour so as to provide an environment with more control and support.

2.5.3.3. Intimate partner violence. The mental health of women who experience physical and psychological IPV is severely compromised (Coker, Smith, Thompson, McKeown & Bethea, 2004; Matseke, Peltzer & Mlambo, 2012; Pico-Alfonso et al., 2006; Street, Gibson & Holohan, 2005; Stein & Kennedy, 2000; World Health Organization, 2015, May 13; Zlotnick, Capezza & Parker, 2011), with the most common mental health consequences to accompany IPV being PTSD and depression (Zlotnick et al., 2011). Women who experience both physical and psychological IPV have a higher incidence and intensity of symptoms of PTSD, depression, anxiety, and suicidal ideation, particularly when there is also sexual violence (Pico-Alfonso et al., 2006). Psychological IPV is marked as a particularly dangerous form of abuse, being associated more strongly than physical IPV with suicidality and mental illness. IPV refers to actual or threatened violence of a sexual, physical, or psychological type enacted by partners, either current or past.

IPV is regarded by the World Health Organisation as a key public health issue (Coker et al., 2004) with short-term and long-term consequences for physical and mental health in women (Pico-Alfonso et al., 2006). A total of 87 000 women were killed intentionally in 2017 across the globe, an increase of 39 000 deaths from 2012 (UNODC, 2018). Of these, 30 000 were killed by a current or former intimate partner, and Africa, with the second highest figure of women killed by an intimate partner or family member, is named in the United Nations report as the region where women are most at risk of intimate partner violence. South Africa's 2016 Demographic and Health survey found that one in five women who have ever been partnered with a man in their lifetimes (including being married, divorced, widowed, separated, living with a man as if married, fiancés and boyfriends) had experienced IPV (Statistics South

Africa, 2017). Women in urban areas such as Soweto were able to report more readily than rural women, possibly indicating that the figures could be even higher. Women who experience violence during pregnancy experience negative maternal and infant health outcomes such as lingering pelvic disorders, premature births, preterm labour, vaginal bleeding, placental abruption, and C-sections as well as exposure to communicable diseases like HIV and other sexually transmitted diseases (Matseke et al., 2012). South African evidence shows that women diagnosed as HIV-positive are more likely to have experienced IPV than women who are HIV-negative, and women who have experienced violence are 50% more likely to receive an HIV-positive diagnosis. As the women studied are childbearing age, the intersection between sexually transmitted diseases, negative health outcomes for mother and infant, poor pregnancy health and IPV severely compound the public health issue, considerably burdening the public health budget with the raised costs involved in treatment for these conditions (Matseke et al., 2012). IPV is also associated with eating and sleep disorders, social dysfunction, and a greater risk of substance abuse (Pico-Alfonso et al., 2006). When PTSD and depression co-occur in women who have experienced IPV, there is indication of a more critical mental health decline (Pico-Alfonso et al., 2006; Stein & Kennedy, 2000). Further, incidence of childhood abuse and further instances of trauma in adulthood results in an increased risk for IPV (Pico-Alfonso et al., 2006) and increases the likelihood of developing PTSD in response to later traumatic events (Street et al., 2005).

Despite such overwhelming evidence for the prevalence of IPV and comorbid PTSD and depression in women, there are few studies that have investigated the rate of PTSD and comorbid depression in perinatal women with IPV, or among postpartum women with IPV. Guilt and shame are rooted in the aftereffects of child and adult abuse and are associated with greater intensity of PTSD symptomatology in several different populations of trauma, including child and adult sexual abuse populations, and victims of IPV, and they also increase the risk of developing PTSD after experiencing trauma (Street et al., 2005). Using avoidant coping mechanisms, a PTSD-related symptom, is associated with trauma-related guilt and shame. Social support has been identified as a protective factor in PTSD-related situations; women who are abused by their partners may be particularly isolated for various reasons including feeling stigmatised, seeing domestic abuse as a private matter, or fear of being further victimized by their partners if they disclose (Coker et al., 2004; Street et al., 2005; Zlotnick et al., 2011). Social support is believed to moderate mental health outcomes with IPV, particularly suicide, possibly providing an outlet for women when their social networks

are supportive. This points to the importance of assisting women, and particularly perinatal and postnatal women to improve their interpersonal relationships and social support systems.

2.5.3.4. Motor Vehicle accidents. South Africa's road safety record is among the poorest in the world with around 1 million road accidents reported every year (Daily News Reporter, 2018, December 28). Motor vehicle accidents (MVA) are classified as an extreme life event, having extensive consequences that can disturb quality of life, impact on capacity to work, have far-reaching impacts financially, and cause many hours of pain and suffering (Heller, Heller & Levine, 2001). Some consequences may be easily traced back to the MVA, while others may lurk in the background but be no less debilitating.

MVA are reported to be a leading cause of PTSD, preceded only by sexual and physical violence (Coffey, Gudmundsdottir, Beck, Palyo & Miller, 2006; Heller et al., 2001) and increase the risk of comorbid MDD and alcohol or drug related disorders (Hruska et al., 2104). In a study with 158 MVA survivors to assess the incidence of PTSD from MVA, four variables influenced the development of PTSD: previous major depression, experiencing a fear of death during the accident, the degree of physical injury sustained, and whether or not legal proceedings had commenced (Blanchard et al., 1996). Gender impacted on the development of PTSD, with female sex being a predictor for PTSD. Prior PTSD and prior trauma also influence the development of PTSD after a new traumatic event (McFarlane, Atchison & Yehuda, 1997), which advances the possibility that a heightened biological response, as in altered HPA functioning, has been created through epigenetic mechanisms, and results in a sensitised response to further trauma. MVA-related PTSD is thus a serious public health matter, incurring significant cost to both individuals and society (Hruska et al., 2014).

2.5.3.5. Unexpected death of a loved one. The unexpected death of a loved one (UD) is a common experience and is linked with elevated symptomatology in many forms of psychopathology; losing a loved one through an unexpected death is a uniquely stressful event due to the centrality in importance of close relationships throughout the life course (Keyes et al., 2014). The frequency and centrality of UD make it an important public health concern.

Using data from nineteen World Mental Health surveys it was established that UD is a traumatic experience associated with the highest incidence of PTSD across the world, as well as vulnerability to other mental disorders developing (Atwoli et al., 2017). People who were

upwards of thirty-five years of age at the time of UD were found to have higher incidences of PTSD than people under seventeen years of age, more women than men developed PTSD, and people who were currently or previously married at the time of UD were more likely to develop PTSD than people who had never been married. The relationship to the deceased was an important predictor of PTSD with the highest incidence of PTSD occurring when the relationship to the deceased was spousal or parental. A further significant predictor was whether the respondent believed they could have done something to prevent UD. Prior lifetime exposure to traumatic events only predicted PTSD significantly when the events involved interpersonal violence or disasters caused by people, although when the traumatic event was childhood abuse related to parental mental illness, parental alcohol abuse, or sexual abuse, this was found to be a significant predictor of PTSD.

UD is most likely to be rated by people as their worst traumatic experience, regardless of other traumatic experiences, and increased incidence of major depressive events, panic disorder and PTSD are observed after UD (Keyes et al., 2014). UD is also associated with manic episodes, phobias, excessive use of alcohol and generalised anxiety disorder in older adults. To be classified as a PTE, DSM-5 requires that UD be directly witnessed, or violent and unexpected.

Some people who experience traumatic events do not develop PTSD. Factors affecting the capacity to endure trauma without developing symptomatic conditions are examined in the next section on resilience.

2.6. Factors Influencing Resilience

Studies considering childhood abuse, including maltreatment, domestic violence, war, rape and displacement, found consistent parenting, positive attachment with caregivers, strong social support networks, a sense of values, religious or spiritual beliefs identifying meaning in suffering, and humour to be key predictors for resilience and competence in children (Horn, Charney, & Feder, 2016; Luthar et al., 2000; Pastorelli et al., 2015). Stage of development is considered a crucial factor in resilience. Infancy and adolescence are particularly vulnerable times where brain plasticity is most sensitive to external and internal, positive, and negative influences. An individual's sense of capacity and control over the stressor is another key factor in resilience (Dohrenwend, 2000; Southwick & Charney, 2012) and their capacity to overcome an initial stressor successfully may assist in being more resilient to later stressors. When the daily environment of the individual is one that is

inherently stressful, with poverty, unemployment and trauma never far away, resilience is based in the creative expression of "deep social and spiritual connection and belonging found in collective voice, movement, and creative self-expression" (Horn, 2020, p. 92).

Positive emotions operate as inoculation, promoting receptivity to social support and adaptive coping behaviours and thoughts (Frederickson, 2004; Garland et al., 2010). The capacity to monitor negative thought patterns and replace them with positive thoughts, called cognitive reappraisal, is a feature of resilient individuals (Horn et al., 2016). Social support is a consistent feature of resilience across all ages and is linked with healthier mental and physical states. Physical exercise is linked with greater self-esteem and enhanced brain plasticity, and mindfulness, yoga and meditation have become widely used in the treatment of PTSD.

Resilient women with a history of sexual abuse were found to have higher prefrontal activation when engaged in cognitive reappraisal when compared with women who have PTSD, and reduced activation in the dorsal lateral prefrontal cortex was found in veterans with PTSD, who were engaged in cognitive reappraisal (Horn et al., 2016). PTSD causes a reduction in volume of the prefrontal cortex (PFC) which causes dysregulation in the executive functioning of the brain and decreases the extinction of fear responses (Sherin & Nemeroff, 2011). In contrast, long term meditators and yoga practitioners have thicker prefrontal cortices than control groups (Goleman & Davidson, 2017), indicating the value of using these techniques in the treatment of PTSD.

The next section considers the literature on women of childbearing age who have PTSD with co-occurring conditions, and the implications of this during pregnancy for the foetus, infant, and developing child.

2.7. Implications of Maternal Comorbid PTSD for the Foetus and Developing Child

One of the long-term effects of PTSD is the disproportionate production of glucocorticoids, which can suppress the immune system, have negative effects on the nervous system, and disrupt learning, memory, and brain plasticity (Sapolsky, 2000). In pregnancy, heightened levels of maternal stress and anxiety related to trauma, with accompanying HPA axis changes, may become "permanent neuronal changes" (van der Kolk, 1994, p.255) creating deficits in infant brain development and increased levels of cortisol for mother and infant (Koen et al., 2017). This may be accompanied by an increased risk of the infant developing "a biological vulnerability to PTSD" (Morland et al., 2007, p.304; Schore, 2001). Glucocorticoids that cross the placental barrier can impair the amygdala's capacity to put the

brakes on, so that infants of high-stress mothers are born with a brain less capable of self-soothing and switching off the alarm system (Jennings, 2013). Reduced cortisol levels were found in the saliva of the one year old infants of women who were exposed to the World Trade Centre attacks while they were pregnant, indicating the transmission over the placental barrier of the effects of PTSD (Yehuda et al., 2008).

Exposure to elevated levels of stress and stress hormones in utero, particularly early in pregnancy, has significantly negative influences on nervous system development in the foetus, infant and child, resulting in retarded foetal growth and reduced intellectual functioning in infancy, impacting childhood and beyond (Sandman, Davis, Buss & Glynn, 2011). Maternal PTSD is negatively associated with fine motor and emotional regulation for infants in LMICs and increased levels of pregnancy-specific anxiety is linked with lower mental and motor development outcomes for six-month-old infants (Koen et al., 2017). Evidence shows links between high pregnancy anxiety at nineteen weeks gestation and reduction in density of gray matter volume in the brains of the six to nine-year-old children of the pregnant women (the same results were not confirmed for twenty-five- and thirty-one-week's gestation) (Buss, Davis, Muftuler, Head and Sandman, 2010).

Findings on perinatal depression show links with preterm delivery (before thirty-seven weeks), low birth weight, and intrauterine growth restriction (Stein et al., 2014). This relationship is greater in LMICs, where resources are limited, than in high-income countries. A study on prematurity with 16 000 pregnant veterans with PTSD found the numbers for spontaneous early labour have not changed in 50 years (Digitale, 2014, November 6). Preventing prematurity is critical because of the serious associated consequences, including long hospitalisations for the newborn, increased chance of death in infancy, and developmental challenges or enduring damage to vision, hearing, respiration, or digestion. The negative effects of maternal mental illness beyond foetal and neonatal health include a greater risk for emotional problems in childhood, a lowered capacity to regulate fear in infancy, and the risk of clinical depression in late adolescence (Stein et al., 2014).

To be comprehensive, consideration of maternal comorbid PTSD on the foetus, infant, and developing child should include the impact of high-stress mothering on mother-infant bonding. To this end, the next section considers the impact of maternal comorbid PTSD on attachment.

2.7.1. Attachment

World Health Organisation (World Health Organization, 2015, May 13) strategies for improving maternal mental health and child health and development in LMICs emphasise the effects of maternal mental illness on mother and child: 1) The development, wellbeing and survival of infants may be compromised by mothers whose mental health is poor, making them less able to care for themselves and their infants. Prenatal and postnatal depression predicts retarded growth and increased threat of diarrhoea in infants, possibly jeopardising child survival. 2) A good relationship between the mother and baby is critical for optimum psychosocial development of infants and children.

Caregiving relationships are critical in the development of emotional and social wellbeing. When a parent has been previously traumatised, the impact of their insensitive caregiving causes changes in the developing infant brain and the attachment patterns of infants and children can be disrupted (Breidenstine et al., 2011; Carleton & Ho, 2009; Schore, 2000; Zeanah, Boris & Larrieu, 1997). Risk factors for disrupted attachments frequently accompany trauma, and when the trauma originates in childhood, there is a greater likelihood of a dysfunctional parental adult attachment pattern being passed onto their infant. A history of physical and sexual abuse among mothers of 18-month old infants was related to an increase in hostile and abusive behaviours towards the child, and less physical and emotional involvement with the infant (Lyon-Ruth & Block, 1996). The infants displayed an increase in negative emotions and symptoms of disorganised attachment.

Antenatal depression is related with disorganised attachment irrespective of postnatal depression (Stein et al., 2014). The capacity for mothers to respond to their babies is disrupted by mental illness during pregnancy. This was tested in rats, and it was shown that antenatal stress restricts caring behaviours towards the infant rodents. The disturbance in maternal programming (caring behaviours towards the infant) caused by mental illness during pregnancy is related with insecure attachment styles and may expose children to maltreatment (Pearson et al., 2012).

There are few studies on the impact of PTSD on the perception of parenting and parent-child relationships, intimate relationships, and family functioning in the general population. Research on parenting has largely focused on maternal parenting (Cohen, Zerach & Solomon, 2011) and a large body of research has shown that maternal mental health, with particular reference to PTSD and comorbid depression, is a risk factor for negative mother-infant and mother-child relating, and developmental difficulties for the infant and child (Ammerman,

Putnam, Chard, Stevens & Ginkel, 2012; ; Bosquet Enlow et al., 2011; Kingston, Tough & Whitfield, 2012; Koen et al., 2017; Lefcovics, Baji & Rigo, 2014; Matseke et al., 2012; Onoye et al., 2013; Seng et al., 2013). Given that: PTSD symptoms are heightened in pregnancy (Seng et al., 2010); prevalence rates for postpartum depression are between 9% and 19%, and between 3.6% and 15% for postpartum PTSD; and rates from the National Comorbidity Survey (Muzik et al., 2017) for the comorbidity of PTSD and depression show that 24.7% of depressed women have PTSD, and 48.4% of women with PTSD suffer from depression; there is a significant risk of negative parenting behaviours when there is maternal PTSD.

2.7.1.1 PTSD and interpersonal relationships.

Avoidance/numbing, re-experiencing and hyperarousal are characteristic symptoms of PTSD (Rytwinski et al., 2014); avoidance coping mechanisms are associated with guilt and shame (Street et al., 2005) and may cause traumatised individuals to avoid contact with people and situations that trigger memories and re-experiencing of the traumatic event. This impacts on social support networks (which have a negative association with PTSD symptoms); a greater severity of PTSD symptoms is associated with fewer and less effective social support networks (Beck, Grant, Clapp & Palyo, 2009). In a sample of people with PTSD from serious MVA, symptoms of PTSD impacted on relationships with close friends, social functioning within a broader circle, with family, and with a romantic partner. Emotional numbing was more significantly perceived to impact social support than hyperarousal. With both measures, depression weighed in heavily as impacting on interpersonal relationships with close friends.

Attachment and bonding dysfunctions raise the query of the origin of dysfunctional parenting behaviours. The next section considers the literature on the intergenerational transmission of PTSD with twin studies, family history research and second-generation studies.

2.8. Intergenerational transmission of PTSD

PTSD as an inherited psychopathology with very stable physiological characteristics has been tested in studies with monozygotic and dizygotic twins (Fisher et al., 2015; Stein et al., 2002; True et al., 1993; Xian et al., 2000), family history research (Danieli et al., 2015; Danieli, Norris & Engdahl, 2016; Davidson, Smith & Kudler, 1989; Davidson, Swartz, Storck, Rama Krishnan & Hammett, 1985) and second generation studies (Danieli et al., 2015; Danieli et al., 2016; Roberts et al., 2012; Yahyavi, Zarghami, & Marwah, 2014; Yehuda et al., 1998; Yehuda et al., 2008).

In addition to the consequences of early life trauma on the physiological and psychological health of the individual, adverse prenatal conditions are associated with negative cardiovascular, metabolic, neuroendocrine and psychiatric outcomes in the adult, and there is some evidence that enhanced production of endogenous glucocorticoids in the prenatal environment due to maternal stress may even change physiology and psychology into the next generation without there having been any additional exposure to trauma (Seckl & Meaney, 2006).

Epigenetic mechanisms may be responsible for the inherited physiological changes evident in transgenerational PTSD, such as the changes that occur in the HPA axis (Perroud et al., 2014; Yahyavi et al., 2014). A study on the offspring of Holocaust survivors found that low levels of cortisol in mothers during pregnancy directly influenced changes in gene expression and HPA programming in their children (Yehuda et al., 2008). Low levels of cortisol were found in the children of Tutsi widows who experienced trauma during the Rwandan genocide (Perroud et al., 2014). The children of the widows, pregnant at the time of the genocide, were compared with the children of a control group of Tutsi women at the same stage of pregnancy, living overseas at the time of the genocide. The children of exposed mothers were at greater risk for adult psychopathology like depression and PTSD; they had lower cortisol levels due to changes in the HPA axis, and they showed similar epigenetic changes in specific genes as their mothers, reinforcing findings from other studies that foetal exposure to maternal stress causes epigenetic modifications in gene structure and, through these mechanisms, is associated with negative developmental outcomes for brain and behaviour development for the foetus.

Professor Godfrey states of the new evidence provided by the research conducted on the GUSTO birth cohort (2010) umbilical cord tissue DNA that, “fixed changes in a baby’s genes have only a modest influence on its epigenetic profile at birth and that most of the variation between babies arises from interaction between the environment experienced in the womb and the genetic information inherited from the parents.” (University of Southampton, 2014, April 28). Results indicated that 25% of the epigenetic variation between the babies was explained by genetic differences on their own, and 75% were explained by the interaction between genetic differences and the environment in the womb.

The next section considers the impact of various tools utilised by the practice of yoga and meditation on the structures of the body and brain, and how this interacts with the

psychophysiology of PTSD to create possible relief of the broad array of symptoms that accompany trauma.

2.9. Yoga Therapy and PTSD

The benefits of yoga derive from a wide range of approaches used to practice the postures, typically in combination with breathing and mindfulness techniques. The slow and controlled manner of achieving the postures, and the mindful benefits of constant monitoring of the body in space to achieve the correct tension and balance, and synchronised breathing, achieves parasympathetic tone (Omkar, Mour & Das, 2011).

The vagus nerve, the longest cranial nerve, controls the parasympathetic nervous system (PNS). As the majority of vagus nerve branches are afferent, the slow deliberate movements and depth and length of breathing involved in yoga postures communicate states of relaxation to the brain through the vagus nerve, which regulates striated muscles of the face, head, neck and several organs in the body (Khalsa et al., 2016). The yoga movements also engage the basal ganglia in the brain, responsible for body awareness, coordination, and procedural learning, and influencing executive functioning of the cortex and social behaviour.

Yoga postures have been shown to affect psychological states by changing neuroendocrine levels, altering risk propensity, and capacity to tolerate levels of pain (Khalsa et al., 2016). Carney, Cuddy and Yap (2010) show that expanded, open physical postures reminiscent of "the proud peacock" or "high-power" physical postures (p. 1363) used in yoga, decrease cortisol and increase testosterone resulting in elevated feelings of power, and ease with taking risks.

Long slow breathing augments the baroreceptor reflex which impacts heart rate. Slowing the breath to less than six breaths per minute decreases chemoreflex sensitivity (determines the amount of oxygen available in the body), increases baroreflex sensitivity (controls heart rate variability (HRV) and vagal tone), and improves quality of life (Bernardi, Gabutti, Porta & Spicuzza, 2001). Slow breathing controls the autonomic nervous system (ANS) by increasing vagal afference; this increases HRV, respiratory sinus arrythmia (RSA) (balance between heart rate and breath), and baroreflex sensitivity (Khalsa et al., 2016). A particular type of yogic breathing (*ujjayi* breath) employs resistance against the incoming and outgoing breath through contracting the laryngeal muscles, impacting on vagal nerves in the pharynx and lung tissue which stimulates vagal afferents to the brain (Brown & Gerbarg, 2005; Calabrese, Perrault, Dinh, Eberhard & Benchetrit, 2001).

Alternate nostril breathing, a yogic breath practice, has been shown to increase PNS activity, impact brain activity so that simple problem solving is significantly improved, and decrease heart rate and blood pressure significantly more than two control groups told to relax on a couch or breath quietly for 20 minutes (Subbalakshmi, Saxena & D'Souza, 2004). Perhaps the most important advantage to breath training is that it is easily available to everyone, is cost-free, available in any setting, and precisely at the times when it is needed in the hustle and bustle of daily stressful living (Sovik, 2000).

Just as physical posture, breathing patterns are linked with emotional states, and changing breath patterns impacts on emotional states and tidal volume (Khalsa et al., 2016). Two brain pathways are involved in vagal afference. One pathway involves the limbic system with the hypothalamus, amygdala, hippocampus, stria terminals and limbic cortex which directly impact the ANS, endocrine system and emotions (Brown & Gerbarg, 2005). The other pathway involves the cerebral cortex and higher-level cognitive processes. The breath exercises and meditations used in the practice of yoga impact on both pathways. Breath can be manipulated to induce different feeling states such as joy, sadness, fear, anger, erotic love, and tenderness (Bloch, Lemeignan & Aguilera, 1991). Heart rate, blood pressure, facial expressions, breathing rates, body postures and reports on emotions were recorded in subjects who were experiencing powerful states of emotion stimulated by memory in deep hypnosis, and actors who were asked to remember emotionally charged events. Results showed that both groups displayed similar expressions and distinctive breath patterns were associated with the different emotions they were experiencing.

The use of anti-anxiety medications has necessitated the exploration of other techniques to reduce anxiety due to considerable side-effects that accompany their use (Manzoni, Pagnini, Castelnuovo & Molinari, 2008; Pal, Ganesh, Karthik, Nanda & Pal, 2014). Meditation, progressive relaxation of the different muscles of the body, and relaxation training applying the use of relaxation in various situations, have all been successfully used for the treatment of anxiety in many studies. Relaxation training is now used as an autonomous treatment method. Relaxation is easily adapted to community settings, educational and hospital environments and is a cost effective, side-effect free approach for diverse populations and clinical disorders (Khalsa et al., 2016).

Sound is perceived as a physical force that can move matter and is used in Western medicine in the form of ultrasound scans and the sonic laser (Dempsey, 2000). The body both makes

sounds and is responsive to sounds. Specific parts of the body, such as organs or other areas, vibrate at similar frequencies with a certain pitch; when a different pitch is introduced through a sound vibration, the cells in that part of the body change their pitch through entrainment (Dempsey, 2000). Entrainment is defined as "the ability of a vibration to reach out through vibrational waves to set off a similar vibration in another body" (Andrews, 1999 p.9 in Dempsey, 2000). With disease, the pitch in that part of the body is dissonant and can be brought back into resonance with sound. When the cells are restored to their natural state of resonance, the body is purified of emotions that can initiate or perpetuate diseased states and unhealthy behaviours. During sound healing sessions, people can experience a feeling of release as traumatic memories are remembered and the accompanying energies locked in the body are released as emotion or physical responses such as shaking or trembling. Below are some testimonials from people who have taken part in sound workshops:

"Each time I am chanting, I feel uplifted. I feel that life is worthwhile to live." (Workshop participant in Dempsey, 2000, p. 48).

"Often my chanting is silent because of the circumstances surrounding me. I do it to, occasionally, relieve a feeling of desperation inside me, to make a change to something that is happening to me, and it always works." (Workshop participant Dempsey, 2000, p. 49).

Chanting and toning is used extensively in yoga-based practices for many of the same purposes as outlined above and can bring the practitioner into a calmer state of consciousness within three to eleven minutes of practice. Chanting is also used to create physiological changes in the body, such as to improve the capacity of the senses to see, smell, and taste better, and to improve the quality of communication (Garfield, 1987).

With the use of electroencephalograms, increased ANS activation has been associated with increased alpha and theta brainwaves in studies of Tantric yoga practices, and forms of Buddhist meditations using chanting and visualisation (Newberg & d'Aquili, 2000). Brain imaging techniques that measure cerebral blood flow (associated with neural activity) are more accurate in identifying specific brain regions involved, and they have shown substantial increases in brain activity in the prefrontal cortex.

With the use of yoga in specialised veteran PTSD treatment programs in the US, several aspects mirroring the research results above were noted: the emphasis on staying present by focusing on the breath and the resulting concentration required could decrease feelings of anxiety and worry and calm specific fears; the philosophy of acceptance and non-judgement

taught as part of the practice could assist in addressing avoidance behaviours; practices that emphasise controlling the breath may decrease hyperarousal; and the physical body postures may help to release trauma that is physically locked in the body thus calming and regulating gut and other internal organs and nervous system functions (Libby, Reddy, Pilver & Desai, 2012). Libby et al. introduce a caution in the use of yoga therapy to treat PTSD: the guidelines offered by the International Association of Yoga Therapists (IAYT) may not adequately address the training needs of individuals offering yoga therapy, particularly when it comes to working with chronic or severe psychological illness, including PTSD. This caution emphasises the need for more research on yoga therapy as an effective treatment for mental illness, to afford it the same rigorous scrutiny as other medical professions, and to get it out of the side-lined and thus less examined position which it currently occupies.

The potential benefit of an Indian healing practice within an African context is important to consider. African spiritual philosophies overlap with some yogic practices and philosophies. A complete exploration of the similarities and overlaps in African and Indian healing systems is beyond the scope of this review. However, some obvious overlaps are worth mentioning considering their inclusion in the program used in this study (see Appendix L). The concept of "The Great Goddess", or "First Mother", written about by Mutwa (2003, p. 33-60) and Adi Shakti, or Divine Mother energy used prolifically in Kundalini yoga practices ("Yogic Living: Adi Shakti—Primal Power." n.d.) have many similarities. Particularly when used in pregnancy, this spiritual connection with an archetypal spiritual mother energy may bring relief and calm to a new mother anxious about her own capacities to be a mother (particularly if her relationship to her own mother was dysfunctional) and even to a woman expecting a second or third child. By comparison to her own limited knowledge, this sense of an available greater or higher source of wisdom may be reassuring. The fusion of Spirit and matter underlie both knowledge systems, as well as the notion that human life should be dedicated to the realisation and manifestation of this fusion, bringing the person in contact with the Spirit world in which the ancestors live. The use of yoga practices is to create the rising of the *umbilini (*Mutwa, 2003, p. 13), or *kundalini* (Eliade, 1958, p. 245), and is the goal of this fusion. The practices involved in yoga and meditation to cause the rising of the kundalini/umbilini are based on rhythm, sound, and movement, and involve the use of rituals, music, sound (singing bowls, bells, and gongs), singing, rhythmic movements, and chanting for long periods of time to induce enhanced and altered states of consciousness for the purpose of healing the body and mind (Goldsby, Goldsby, McWalters, & Mills, 2017;

Heather, 2007; Khalsa et al., 2016; Muehsam & Ventura, 2014). These practices are familiar to African communities that use shamanic approaches to healing with dancing, singing/chanting, drumming, music, ritual, divination, and other embodied practices to create trance states in which the world of spirits can be accessed (Vinesett et al., 2017; Winkelman, 2010). Shamanic approaches, such as those used in many indigenous cultural groups, share with meditation and yoga practices a state of consciousness that focuses on the body as it is in the present moment and in doing so, gives an "understanding from a large and dispassionate perspective" (Vinesett et al., p. 801). According to Winkelman (2010), shamanic practices are central to our shared human ancestry, and yoga and meditative practices are the descendants of shamanism, extending the capacity to control and examine attention, perception and conception processes underlying consciousness (location 114).

2.9.1. The Psychophysiology of PTSD.

Research into neurobiological markers for PTSD now understands that the presence of certain individual pre-existing pathologies could be released by exposure to a traumatic event and predispose the individual to developing the signs and symptoms associated with PTSD (Sherin & Nemeroff, 2011; Yehuda, Harvey, & O'Carroll, 1997). The intersection between undesirable environmental interactions, somatic stress reactions, and pathology results in changes in the endocrine system, nervous system, immune system, brain chemistry, and brain circuitry in individuals who have PTSD (Sherin & Nemeroff, 2011). Mehta and Binder (2012) state that, "A dysregulation of this response at any level may contribute to an enhanced vulnerability or compromised response to stress and thus an increased susceptibility to develop stress- and trauma-related psychiatric disorders, including PTSD." (p. 655).

When there is pathology, such as PTSD or C-PTSD, with excessive production of glucocorticoids, and thus disrupted HPA axis functioning, hippocampal atrophy is promoted: hippocampal volume and activity are reduced which changes the capacity of the stress response to switch itself off (Sherin & Nemeroff, 2011). There is a reduction in volume of the prefrontal cortex (PFC) which causes dysregulation in the executive functioning of the brain and decreases the extinction of fear responses. Activity in the amygdala increases which is responsible for the hypervigilant syndrome in the pathology, and the ability to discriminate for threat is weakened.

High levels of activation of the sympathetic nervous system (SNS) is associated with the PTSD symptom of hyperarousal, and an incapacity to downregulate from hyperarousal

(Yasuma & Hayano, 2004), and is linked with an elevated heart rate, and a lowered resting heart rate variability (HRV), suggesting an enduring dysregulation of the ANS (Blechert et al., 2008) with increased SNS tone and decreased parasympathetic nervous system (PNS) capacity (Cohen et al., 2000). Heart rate (HR) is controlled through SNS and PNS activity and fluctuates around a mean value. Respiratory sinus arrhythmia (RSA) is the combination of HRV and respiration; with RSA the heartbeat speeds up during an inhale and slows down during an exhale giving an indication of cardiac vagal function (Yasuma & Hayano, 2004). With PTSD, a lowered RSA is linked with a lowered ability to regulate emotions and decreased capacity to recover from affective arousal and is seen as a predisposition for emotional pathology. As RSA is linked with breath and physical movement, it could be a useful quantitative biomarker for testing the impact of the breath and movement related aspects of yoga therapy in future research studies.

2.9.2. Interoception.

Interoception is the conscious or unconscious awareness of somatic internal states and is linked with emotion regulation and resilience (Grabbe & Miller-Karas, 2017). Childhood traumas leave their mark on brain structures and result in dysregulation of brain circuitry, dysfunctional behaviours, and psychiatric disorders, impacting on virtually all the body's systems and resulting in the interruption of this "felt sense" (p.4). The capacity to be present to the body is thought to be crucial for preventing and treating the signs and symptoms of PTSD. The brain structures implicated in interoception include the insula, somatosensory cortex, brain stem, and ACC (Khalsa, Rudrauf, Feinstein & Tranel, 2009; Steinwand, 2017). These brain structures are deeply embedded in the brain and form part of the executive control centres of the cortex, showing markedly decreased activity and reduced volume in people who have experienced multiple traumas (Grabbe & Miller-Karas, 2017). Somatosensory afferents from the skin and network of brain structures including the somatosensory cortex, the insula, and the ACC, facilitate the interoceptive awareness of the heartbeat (Khalsa et al., 2009). Acute or cumulative trauma may result in the loss of a sense of self (or never developing one with developmental trauma) and the gradual relearning, or learning for the first time, the skill of interoception is critical to regaining or developing a sense of self.

2.9.3. The Psychophysiology of Yoga Therapy.

Yoga-based practices can be effective in facilitating an adaptive stress response by regulating the ANS and decreasing allostatic load (Khalsa et al., 2016). As mentioned in other sections of this paper, yoga and meditation impact on the vagus nerve through yoga-based movement and breath practices and promote engagement or disengagement with the wider environment, affecting physical, emotional, cognitive, and social processes. Physical postures promote stimulation of the peripheral vagus nerve and enhance afferent communication to the brain structures involved in interoception, regaining the sense of self that is lost in trauma. Slow rhythmic breathing stimulates PNS response and promotes the capacity to stay aware and present in a non-reactive way when the body is placed under stress during yoga and meditation practices. This response can generalise to other situations allowing the development of strategies for dealing with challenging experiences.

2.10. Yoga therapy and pregnancy

There is abundant evidence-based research on the efficacy of yoga in pregnancy in both physiological and psychological domains (Battle, Uebelacker, Magee, Sutton, & Miller, 2015; Davis, Goodman, Leiferman, Taylor, & Dimidjian, 2015; Gong, Chenxu, Shen, Wu, & Jiang, 2015; Jayashree et al., 2013; Jiang, Wu, Zhou, Dunlop, & Chen, 2015) and for improved outcomes for pregnancy, labour and birth (Curtis, Weinrib, & Katz, 2012; Jayashree et al., 2013). Findings from RCTs indicate that yoga during pregnancy may result in lower stress levels, greater enjoyment of life, improved interpersonal relations, adaptive autonomic nervous system activity, and ease labour by reducing pain and duration. While there is an abundance of evidence for the use of yoga in pregnancy, RCTs are necessary to explore and prove the effectiveness of yoga therapy during pregnancy when there are symptoms of PTSD. At present there are no such studies published.

Yoga in pregnancy should be done under strict supervision and with properly trained therapists (*Side Effects of Yoga Exercises: Yoga Precautions*. (n.d.). There are many precautions for practicing yoga for people with medical conditions, including pregnancy, and understanding the limitations and possible contra-indications of a yoga practice is important, particularly during pregnancy (Morris, 2020). The need for a more careful regulation and recognition of the field of yoga therapy to ensure safe and reliable practices is critical as the spread of online sites continue to give possibly incorrect information. The International Association of Yoga Therapists (IAYT) is attempting to regulate the standards and quality of

yoga therapy programs internationally but is not able to provide much guidance currently due to limited resources (International Association of Yoga Therapists, 2020).

2.11 Conclusion to Literature Review

Women in South Africa are particularly exposed to trauma and the risk of developing PTSD is greater when there is presence of childhood trauma, when women are in their childbearing years, and when they are pregnant. The absence of routine antenatal mental health screening in primary health care settings, coupled with the greater exposure to trauma during pregnancy threatens foetal, infant and child development, enhancing the risk of a continued cycle of intergenerational abuse, and the intergenerational transmission of PTSD. Maternal PTSD is linked with disorganised attachment in children and may result in mental disorders for children and adolescents.

A Westernised approach to PTSD has resulted in a clinical approach to treatment, excluding the social element to which South African women are exposed. Patriarchy and cultural attitudes towards women have given rise to a culture of violence targeting women and children. Trauma is systemically rooted in these practices and an approach to treatment that does not take this into account may be ineffective, particularly in Africa.

Yoga therapy has been used successfully for the treatment of trauma because yoga- and meditation-based practices address precisely the psychophysiological structures affected by trauma. Yoga therapy has been effective in reducing symptoms of PTSD because it downregulates the ANS and enables an enhanced stress response in the body. Yoga therapy is physiologically and psychologically effective in pregnancy, improving outcomes for pregnancy, labour, and birth, and resulting in lower stress levels, greater enjoyment of life, improved relating and regulating ANS activity.

There is no research on the intersection between yoga therapy, PTSD and pregnancy and this study aims to address this gap in the literature.

2.12 Research Questions

1. What are women with self-reported symptoms of PTSD perceptions of how it impacted on their experience of pregnancy, if at all?
2. How did the practice of yoga and meditation during pregnancy impact their experience of pregnancy and birth, if at all?

3. How did the practice of yoga and meditation affect their experience of PTSD symptoms during pregnancy and birth, if at all?

Chapter Three: Methodology

A qualitative phenomenological approach was used, of which the key components for gathering data were purposive sampling, semi-structured interviews, participant journaling, audio recordings from the yoga and meditation sessions, and feedback from the instructors. Ethical considerations of the current study are delineated. The research focuses on the experience of seven South African pregnant women with self-reported symptoms of PTSD (as measured on the PCL-C checklist) who participated in eight weeks of yoga and meditation.

3.1. Research Design

Qualitative and longitudinal study research is best suited to research which aims at exploring life experiences, values, and belief systems of research subjects, enabling consideration of what these mean to the individual (Mbele, 2010). Subjective viewpoints about personal experience, each with their inherent truth (Taylor & Usher, 2001), allows participant voices to be heard from within their unique contexts (Holloway, 1991; Kelly, 1999). Investigating subjective experiences may offer new understandings to inform treatment (Kielhofner et al., in Lippincott, Williams, & Wilkins, 2008). This is potentially important for the complex array of symptoms that accompany PTSD when these co-occur with the influx of hormones during pregnancy.

This study used the multiple case study method, specifically the exploratory case study, which attempts to increase understanding about a phenomenon (Bengtsson, 1999). The experience of the intersection between PTSD, pregnancy, and yoga and meditation was explored with the aim of creating psychological understanding rather than establishing objectively verifiable truths (Kelly, 1999; Westbrook, 1994) and the yoga and meditation program had no single, fixed set of outcomes (Baxter & Jack, 2008). There is limited research on pregnancy, and yoga and meditation (with none in the South African context), and no research on the intersection, which is the focus of this exploratory research study.

The design of this study is not strictly qualitative. The data from the PTSD checklist, Civilian version (PCL-C) was used at two temporal points in the study: before the start, and at the third interview (which in some cases was months after the end of the yoga and meditation intervention). The results are included in the results section in the form of a graph indicating PTSD symptoms that increased, decreased, or stayed the same. The recorded results made a

relevant contribution to the overall findings of the study thus yielding a quantitative component, however small, to the study design.

Qualitative researchers use their own experience as benchmarks while considering data, to assess and evaluate the qualities of their discoveries (Strauss & Corbin,1998). The following points, stressed by Strauss and Corbin, are pertinent to this study and to the researcher: 1) Most researchers hope their work is immediately or prospectively useful in the daily lives of academic and non-academic audiences. 2) Skilled qualitative researchers become completely captivated by their work, and this absorption in and commitment to the work provides a sense of heightened integrity. My work as a yoga therapist with mental and physical illnesses and as a spiritual birth attendant (doula) for thirty-five years, has fostered a strong commitment to researching and documenting the impact and implications of using yoga and meditation.

3.2. Sample

The sample included seven South African women who lived in the greater Johannesburg area and were in their second trimester of pregnancy. Five participants were women of colour (four participants were racially classified as Black and one participant as Coloured in the South African racial classification system), and the remaining two women were racially classified as White.

Despite having had middle class influences in their lives previously, four of the participants of colour were unemployed; three participants were financially insolvent, and their lives were negatively impacted by this. Of these, two participants had no fixed home of their own at the time of their birthing. Of the five participants of colour, two were financially dependent on their mothers, with whom they lived, and for whom their lack of financial independence created relationship tension. One participant of colour had full-time employment and had been well provided for by her deceased spouse. The two White participants were not impacted by financial concerns in any significant way.

Three of the participants of colour had tertiary education with one participant having achieved a post-graduate degree. Two participants of colour had a high school education with some diplomas in tertiary education. One White participant had an undergraduate degree and one had a post-graduate degree.

Two participants, one White and one woman of colour, were in stable spousal relationships. Two participants, one White and one woman of colour, were in ongoing emotionally and/or

physically abusive relationships with the biological father of the child they were carrying. The final two participants of colour had been abandoned by the biological father in the first trimester of pregnancy.

All participants had self-reported symptoms of PTSD arising from traumatic incidents experienced in adulthood such as a previous traumatic birth, the unexpected death of a spouse, car hijacking, multiple motor vehicle accidents, and intimate partner violence. Four participants had experienced ongoing childhood traumatic experiences such as sexual, physical, or emotional abuse. All participants were below thirty-five years of age at the time of the study; four participants were multigravida.

Only one participant had any significant prior experience with yoga and meditation, having practiced it for approximately a decade by taking classes with teachers of different forms of yoga. Of the remaining participants, two had no prior experience at all, and the rest had brief sporadic experiences prior to partaking in the yoga and meditation program, having attended the odd yoga class in person, or exploring meditations online or through reading books. All participants expressed a keen interest in learning about yoga and meditation.

Purposive, a non-probability sampling method was used to select participants. Participants selected using purposive sampling are information-rich cases that are typical of the population under study (Durrheim & Painter, 1999). Program participation was timed to correspond with the second trimester of pregnancy, complying with Ethics Board requirements, and acknowledging the vulnerability of the foetal nervous system to pregnancy anxiety at 19 weeks (Buss et al., 2010). Negative consequences of pregnancy anxiety for gray matter volume in later childhood makes the second trimester an important time for early assessment and treatment of mental illness. The link between depression, PTSD and pre-term birth was a further prompt for starting the yoga and meditation program well before the end of pregnancy.

3.2.1 Inclusion Criteria

Inclusion criteria were South African women in second trimester pregnancy with a PTSD profile as measured by the PCL-C checklist, willing to take part in eight weekly yoga and meditation sessions, have instructors observe and comment on their progression weekly, be interviewed at four different times, and journal their experiences throughout. It was unexpectedly difficult to find participants. I contacted midwives, gynaecologists, and private

maternity clinics, and spoke to professional medical caregivers about the study. This yielded no results, so posters were put up in spaces where there were likely to be pregnant women, and broadcast on social media and WhatsApp groups. Media outlined all the symptoms of PTSD delineated on the PCL-C checklist to create the first filter in the application process. The first four participants were found within one year and they started the yoga and meditation program within months of each other. The final three participants were found over the next eighteen months. All media used to find participants is included in Appendix J.

3.2.2 Instruments

3.2.2.1 PCL-C Checklist. The PTSD checklist, Civilian Version (PCL-C) measures PTSD-similar symptoms and was used to screen for PTSD symptoms in potential participants. The PCL-C was used in a longitudinal study on depression, posttraumatic stress, and alcohol use with South African women by Abler et al. (2014). The PCL-C is a seventeen item self-report measure of the DSM-IV symptoms of PTSD in adult civilian populations; it has been used in diverse samples including pregnant women and has strong psychometric properties with excellent reliability (Gelaye et al., 2017; Kornfield et al., 2017; Van der Walt et al., 2014). Internal consistency is estimated between 0.94 and 0.97 with test-retest reliability of 0.96 at two to three days and 0.88 at one week. Each item in the scale is scored on a 5-point Likert scale from 1 (*not at all*) to 5 (*extremely*) that rates the presence of a symptom in the last 30 days. Participants in this study had to rate a score of 3 (*moderately*) or more on a minimum of one symptom from cluster B (re-experiencing), a minimum of three from cluster C (avoidance), and a minimum of two from cluster D (arousal) to be included in the yoga and meditation program. Clusters of symptoms reflect the DSM-IV diagnostic criteria for PTSD. Cluster B (items 1-5) describes re-experiencing symptoms that include repetitive intrusive memories, flashbacks or dreams of the traumatic event; cluster C (items 6-12) describes avoidance symptoms for example developing avoidant behaviours or thoughts or having trouble remembering the traumatic event; and cluster D (items 13-17) describes symptoms of heightened arousal with trouble sleeping, jumpiness, and hypervigilance. The PCL-C checklist can be found in Appendix E. This instrument was not used as a quantitative measure for the purpose of conducting statistical analyses as the sample size of the study was too small. The measure was used to enrich the data by asking participants to comment on their experiences of specific clusters of PTSD symptoms at before the study began and at the time of the third interview.

Participants whose self-reported symptoms did not reflect the above pattern were directed to pregnancy yoga classes and counselling at a pre-arranged venue in Johannesburg. (This applied to only one person.) The PCL-C checklist was presented again at the third interview, and participants completed it to get a comparison score.

3.2.2.2. Interview. The qualitative interview is an open-ended approach that enables probing, clarification, and structuring following questions based on prior answers (Westbrook, 1994). Three subsequent interviews conducted just after the yoga and meditation program, at thirty-six weeks of pregnancy and post-birth, were structured on the information given in previous interviews, during the recorded yoga and meditation sessions, and from participant journaling.

3.2.3. African Kundalini Yoga (AKY) yoga and meditation program

The AKY yoga and meditation program is based on an eight-week Kundalini yoga and meditation program used in a study with forty-nine women diagnosed with generalised anxiety disorder (Gabriel, Curtiss, Hofmann & Khalsa, 2018) and an eight-week Kundalini yoga and meditation program used in a study with seventy-one women and nine men with PTSD (Jindani, Turner & Khalsa, 2015). These programs were adapted by the researcher to include lineage cleansing practices from lesser knowns areas of yoga, and to accommodate for pregnancy, while still retaining primary elements from both programs as taught in the studies mentioned above. Details of how the inclusion was managed can be found in Appendix L. The researcher is a certified yoga therapist with International Association of Yoga Therapists (IAYT), an international certification and standards body for the field of yoga therapy based in the USA, and is the director and lead trainer for a yoga therapy training institute, Sat Sangat Yoga Therapy, a member school of IAYT.

Yogic lineage cleansing philosophies resemble philosophies guiding healing techniques used by traditional healers in Africa (Mutwa, 2003; Ngara, 2020; Somé, 1994; Somé, 1999). Taiwo Afuape (2011) emphasises that trauma within an African context must include ancestors and connections to family and community within the treatment context. The AKY yoga and meditation program, with its addition of lineage practices, is particularly relevant to working with pregnancy and birth within an African context. Ancestor spirituality is embedded in many of the ethnic groups of the African continent, as well as in the belief systems of the ethnic groups in South Africa (Bongela, 1983; Ngara, 2020). The researcher is associated with African traditional healers at Bookela Botho Institute for Integrated Healing

and Research situated at Selby Park Hospital in Johannesburg inner city and is constantly learning of the many points of contact and overlap between the two indigenous knowledge systems of South African traditional healing systems and yogic healing systems.

Both instructors who facilitated the yoga and meditation program for this study were qualified female yoga teachers trained in the use of the program by the researcher before giving instruction. The instructors were racially classified as White and belonged in a middle-class income bracket; one was South African and the other Namibian. They were both trained as yoga teachers by Kundalini Africa Rising (www.kundaliniafricarising.co.za), an organisation dedicated to social justice and creating access to yoga teacher training for people of colour in marginalized communities. The training includes racial sensitivity, and diversity and inclusion skills training. Further training for the instructors was conducted by the researcher and it included specialist training in trauma-sensitive and pregnancy yoga.

3.3. Procedure

The process of finding participants through social media and relevant WhatsApp networks meant that participants contacted the researcher directly either through Whatsapp or by email. Through this communication, the researcher arranged to meet up with the applicants to administer the PCL-C. Due to the detailed nature of the media that was posted on social media there was only one respondent who did not qualify for inclusion in the study. Participants who qualified for inclusion signed consent forms at the first meeting, and a time was arranged for the first interview to take place within a few days of the first meeting at a convenient venue; for most participants this was either at their place of work, at home or at a public venue close to home. The yoga and meditation program began within a few days of the first interview. Some participants preferred to travel to the researcher's yoga studio for the yoga and meditation program, recognising this as a safe and private space, while others chose to have the therapy at their places of work or at home. The preferred venue was prepared before the start of each session in order to ensure privacy, seclusion and emotional safety for the participant, and the same space was used throughout the eight weeks for each participant. At the end of the yoga and meditation program the researcher contacted the participant on Whatsapp and arranged a time for the second interview. This took place either at the participant's place of work, or at their home depending on what was most convenient for the participant. The researcher contacted the participants again using Whatsapp at 36 weeks and arranged a time for the third interview. For most participants this took place at their home.

For one participant who was staying in Pretoria, this interview took place on zoom. The researcher contacted each participant six weeks after birth to arrange a time for the fourth and final interview.

The timing varied for each participant. While everyone was able to have the first and second interview (before and after the yoga and meditation program) at approximately the same time during their pregnancy, for one participant who started the yoga and meditation program during the last four weeks of her second trimester, the end of the program was in her third trimester, and the second and third interview were held close together. The timing of the fourth interview also varied for each participant. Some were able to have the fourth interview close to the suggested timing (six to eight weeks post-birth), while for one participant the fourth interview could only happen when her baby was six months old.

The instructors' role in the study was to take each participant through the eight-week yoga and meditation program and to report weekly on observations made during the session. This data set was included in the analysis of the data and served to expand on participants' journaling, and what they reported on during their interviews. The first instructor delivered instruction to the first four participants who entered the study, and the second instructor was responsible for the instruction of the remaining three participants, who entered the study eighteen months later. Their relationships with the participants were restricted to the weekly sessions.

Journaling was encouraged from the start of the yoga and meditation program until the time of the final interview. Journaling was the only part of the data set that was not comprehensive. Journal questions were provided to participants as part of home study and participants were invited to include their thoughts on these questions as part of their journaling process. Journal entries were collected at the end of the yoga and meditation program, and again (where they were available) at the fourth interview. While this data set was not comprehensive (six participants did not journal throughout their pregnancy and after birth, and four participant journals were absent from the data set), it did add significant depth to the instructors' feedback, and it added a rich dimension to what participants reported during their interviews.

There were fifty-six individual sessions of yoga and meditation for seven participants. Each session was recorded by the instructor and formed a part of the data set. The researcher could not be present to observe all fifty-six sessions so instead watched the recordings of the

sessions, and researcher notes formed part of the data set. The procedure used for obtaining information from the recordings is included in Appendix I.

3.4. Data Analysis

Data reliability is augmented when there are multiple sources of data, a trademark of case study research (Baxter & Jack, 2008). The advantage of multiple sources of data is that when data sets are woven together, a broader understanding of the study phenomena is gained; the disadvantage may be researcher overwhelm, due to the sheer volume of data. To avoid the dangers of drowning in data, a framework is recommended, to guide the gathering of relevant data. The researcher used Braun and Clarke's guidelines (Braun & Clarke, 2006; Braun & Clarke, 2018; Braun, Clarke & Hayfield, 2019) on thematic analysis (TA) to create the framework for the data sets, and created results based on the four different timelines when interviews were conducted: at the start and end of the yoga and meditation program, at 36-40 weeks of pregnancy and between 3 and 6 months after birth. A small number of individuals who can furnish rich descriptions of their unique experiences can provide enough material through in-depth analysis providing understanding of the lived experience, to delineate the principal nature of a phenomena (Starks & Brown Trinidad, 2007). Seven participants were deemed sufficient (Creswell, 2007) and yielded twenty-eight interviews.

Several data sets were used in this study: twenty-eight interviews, fifty-six recorded yoga and meditation sessions, researcher notes from the observation of each session (either in person on from the recordings), participant journaling where it was available, fifty-six instructor feedback forms from each yoga and meditation session, and two sets of results from the PCL-C checklist, administered before the yoga and meditation program, and at the third interview, around thirty-six weeks of pregnancy. The researcher used each recorded session to verify written feedback from instructors, gaining additional information on how participants responded to yoga and meditation in situ. Researcher notes from in-person observations were compared against the recordings. Participant journaling was gathered at the end of the yoga and meditation program (where available) and was used to augment the researcher's understanding, gained from the instructor feedback and observations made from the recorded sessions, of the internal reflections of the participants on challenges and benefits from yoga and meditation. Information gained in this way helped to shape questions of subsequent interviews. Information gained from interviews was cross-checked against the other data sets to form a more complete picture. Participant journaling (where available) was again gathered

at the final interview, post-birth, and was used to augment understanding of the effects of the yoga and meditation up to nine months later, in the case of some participants. The longitudinal nature of the study, the twice administered PCL-C checklist, and participant journaling enabled a reflection on how yoga and meditation may have assisted in decreasing symptom intensity.

Thematic Analysis was used to generate themes from the data (Braun & Clarke, 2006). The themes provide a greater depth of understanding of individual experience, and any possible impact the yoga and meditation program may have had on the experience of pregnancy and birth, and self-reported symptoms of PTSD. Themes usefully summarise the main features of a body of data, offering a 'thick description', and can reveal parallels and variances across the data set, allowing for social and psychological readings of the data. The focus for inductive methods of research is on considering the dynamics within individual behaviour and on possible alterative future behaviours. It is a bottom-up approach beginning with observations derived from the data set, and ending with theories as a result of the observations (Dudovskiy, 2011). The research design of this study – with open-ended questions and explorative participant journaling – required that the researcher be free to alter course anytime, guided by the data set, to arrive at conclusions unique to the data set. Themes and sub-themes were generated when there were four or more participants reflecting the view contained in the themes or sub-themes.

3.4.1. Themes

To identify the themes, the researcher went through the data sets at four different time points. The data sets included interview transcripts, instructor feedback forms, participant journaling, and researcher notes from in-person or second-person observations of the yoga and meditation sessions. The time delineated data sets were examined repeatedly to become familiar with each data set (Boyatzis, 1998). To maintain the longitudinal status of the study, the data set from each point in time was coded after the interviews were completed. Data from the four interviews thus yielded information from before the yoga and meditation program commenced, after the program was completed, at thirty-six weeks of pregnancy, and after birth. Participants were colour coded so that different sources of data were easily identified. In the first few readings phrases that appeared remarkable were highlighted using the participant's colour. Initial themes were identified and noted on a mind map. Four batches of interviews were treated in the same way producing four sets of initial notes and mind

maps. Each batch of interviews represented a point in time. This process of 'open coding' (Braun & Clarke, 2006) allowed large batches of data to be reduced into categories of patterns in participant responses.

When the initial coding was complete for each interview set (four in total, reflecting the four points in time) the researcher compared the notes and mind maps within each interview set to connect themes together and create overarching themes spanning all participant experience. The researcher used 'axial coding' in the second stage of coding to create the links between themes, and 'selective coding' to compare and contrast themes between interviews so as to identify the themes that bound the entire study together, across seven participants and over a three year period.

Themes across the three interviews after the yoga and meditation program were an increasing awareness of resilience to previously reported PTSD symptoms using the tools that were learned during the yoga and meditation program, and the overall beneficial impact of the program. The theme of resilience was also identified in the first interview held before the program began.

3.5. Ethical Considerations

An ethical requirement for all research studies is informed consent (Kelly, 1999) and a special kind of ethical caution is required for sensitive topics, particularly in areas of "deep personal experience" (p. 295). The sample was a vulnerable population at different stages of antenatal and postnatal experience. Confidentiality was an important consideration of the study, and every effort was made to remove distinguishing details about the participants in the final reporting; names were replaced with alphabetical letters and full transcripts of the interviews were not published in the dissertation.

Confidentiality was ensured through the following steps: recordings of the yoga and meditation session and interviews were accessed solely by the researcher who transcribed all interview recordings; recordings were secured with researcher-only access and will be destroyed after five years. Before the start of the yoga and meditation program, a participant information sheet communicated to participants that withdrawing participation at any time would have no consequences. To minimise issues of coercion or undue influence, information sheets stated that no benefits would accrue from partaking in the research study, other than those of attending free yoga sessions. Signed consent forms gave the researcher permission to observe and record the weekly sessions and interviews. Due to the intersection of trauma

symptoms with pregnancy, the nature of the yoga and meditation program included all precautions for pregnancy, as well as including trauma-sensitive yoga techniques (Cook-Cottone, Vigne, Guyker, Travers, Lemish, 2017; Steinwand & Born, 2017; West, Liang & Spinnazzola, 2017). The researcher supervised the instructors based on feedback and the recordings of each session, to ensure that the level of experience of yoga and meditation of each participant was accommodated. Participants were informed both at the start of the yoga and meditation program, and at other points during the program by the instructors, that they could withdraw at any point with no negative consequences. All participants chose to remain with the program.

The interviews were conducted non-invasively and informally, encouraging participants to remain close to the research topic while still allowing for some exploration. In the interests of an ethical study, an effort was made to construct interpretations furthering the interests of the participants, consulting participants during their construction (Stiles, 1993).

Suitable resources for post-interview debriefing were made available, such as the Emthonjeni centre at Wits University where counselling session/s are available for free, or for a nominal charge. The one study applicant that did not fit the PTSD profile was informed of the Emthonjeni centre and referred to pregnancy yoga classes.

Every effort was made to ensure the comfort and ease of pregnant participants during the yoga and meditation program, with the use of blankets, cushions, low lighting, music, and ablution facilities. During post-birth interviews, comfort of the mother and infant was prioritised, with provision made for infant feeding, rest, and regular breaks. The instructors who facilitated the sessions had been in training with the researcher since 2015, including working with pregnancy and trauma, and were internationally certified yoga teachers.

The researcher contacted participants six weeks after birth and requested a time for the final interview to take place. In all cases, the participants chose to do the interview at a later stage, with one interview taking place when the infant was six months old. The researcher conducted the final interview at the homes of the participants. Participants were informed that they could stop the interview at any point and reschedule for another time should the experience become uncomfortable for any reason.

3.6. Quality Control

Baxter and Jack (2008) elucidate several key points for the novice researcher, to ensure a reliable multiple case study design: clearly state and substantiate the research study question; ensure the design is appropriate for the research question; use purposive sampling strategies; collect and analyse data successfully. Further, researchers should view and explore multiple sources of data from different angles and consider participants and phenomena intensely, or over a long period of time, to create a solid connection, decrease social desirability reactions and increase numbers of perspectives gained. Researchers should check interpretations and observations with participants. The longitudinal nature of the data collection in this study enabled participant verification of observations, in the sequential interviews and journaling. Multiple sources of data increased reliability, assisting in reducing social desirability reactions. Researcher process was carefully journaled, keeping track of experiences and highlighting apparent biases.

Issues of transparency and data transferability raised challenges, as with determining how much data to reveal without encroaching on the right of participants to privacy. Participant permission to use sections of interviews in print was included in the participant consent form, however the tension between making full data sets available (Moravcsik's "transparency revolution" (2014, p 665)), and protecting a participant's right to privacy, was a constant challenge. The right to privacy took precedence over transparency in this study, given the sensitive nature of the information on trauma symptomology. Full transcripts of the interviews were not provided, but every attempt was made to provide sufficient depth and breadth in the given extracts to validate the themes generated during analysis.

Lincoln and Guba (1985) proposed four criteria for the evaluation of qualitative research, based on the notion of trustworthiness, a term often used to replace validity. Their four criteria for trustworthiness are credibility, dependability, transferability, and confirmability.

Credibility refers to the degree to which findings make sense (Lincoln & Guba,1985). Lincoln and Guba recommend the use of the member check "whereby data, analytic categories, interpretations and conclusions are tested with members of those stake-holding groups from whom the data were originally collected" (p.314) to establish credibility. They also recommend prolonged engagement with the data. This study used both techniques. Regularities in the data that led to the interpretations made are clearly revealed (Corbin & Strauss, 1990), text extracts are included for the benefit of the reader, and interpretations and conclusions were tested in subsequent interviews and by cross-checking data sets.

The degree to which the findings of the study can be applied to similar settings refers to the concept of transferability. Lincoln and Guba (1985) refer to thick description as a way of describing a phenomenon in sufficient detail to evaluate the transferability of conclusions drawn to other times, settings, situations, and people. The richness of participant experiences revealed in their quotes, and the similarities and differences between participants allows a depth of understanding for future research to build upon.

Dependability, the third criterion, encourages researchers to provide an audit trail in the form of documentation of data, methods and decisions about the research that are transparent and available to external scrutiny (Finlay, 2006). The purpose is to evaluate the accuracy and evaluate whether the findings, interpretations and conclusions are supported by the data (Lincoln & Guba, 1985). Every effort for transparency has been made in this study.

According to the Robert Wood Johnson Foundation Qualitative Research Guidelines Project (Colin & Crabtree, 2006) confirmability of the research depends on whether the research findings can be confirmed or sanctioned by other researchers and, in addition to having a clear description of the research path this should include research design and data collection decisions and the steps that were taken to manage, analyse and report the data, and information about sampling. Both these criteria are adhered to in the provision of an audit trail to aid the reader's understanding and to benefit future research.

3.7. Self-Reflexivity

Reflexivity in qualitative research is a frequently discussed method of increasing the quality and trustworthiness of research (Denzin & Lincoln, 1998, cited in Smith, 2006). Smith (2006) calls it a "way of knowing – a method of discovery and analysis" (p. 209). Where traditional science focuses on denying the self, qualitative self-reflexivity reveals the self, depicting the range of worlds and experiences that gives depth and dimension to the research (Barone, cited in Smith, 2006; Krieger, 1991 cited in Smith, 2006). The researcher's internal dialogue with a constant scrutiny of the knowledge components and how they are obtained, increases trustworthiness and the rigour of qualitative research (Hertz, 1997 cited in Smith, 2006; Rolfe et al, 2001 cited in Smith, 2006; Schon, 1987 cited in Smith, 2006).

In sum, instead of this personal involvement spoiling the research process, being conscious of it can enable the researcher to guard against gratuitous biases that prioritise the researcher's own needs and highlight complexities and challenges which could be hidden in other forms

of research (Mbele, 2010). Through continuous self-reflection the researcher hopes to avoid intentional or unintentional contamination of the research findings.

It is important to locate myself as the researcher within this study as this has informed the research topic. Practice as a yoga therapist and a doula has inevitably coloured my vision. My position as observer in the yoga and meditation sessions, and not therapist, has highlighted this. The therapist eye shaded the observer position, as did my training in identifying signals indicating possible physical, emotional, mental, and spiritual discomfort. This is not necessarily negative, as the constant switching between the two positions assisted in maintaining somewhat the distance required for a self-reflexive approach.

Alcoff (1991-1992) outlines the problems of speaking for other people as a researcher. I differed from most of the participants in a variety of noticeable ways: race, cultural experience, gender affiliation, age, life cycle, and for some of the participants, socio-economic status. Alcoff's outline of the problems felt very pertinent as I examined the data and strove to understand the words and expressions used by the participants in a way that recognised my biases, prejudices and privileges as far as possible. The most difficult prejudice to avoid was age and life cycle. As a menopausal woman who has birthed two children naturally, at home, with the help of an extensive yoga practice, this was a position that needed rigorous recognition to avoid viewing data from within this prism.

To this end I have been able to use the supervision and mentorship of the director of the Guru Ram Das Institute of Medicine and Humanology, Dr Shanti Shanti Kaur, and her colleague, Sat Bir Singh, director of research for the Kundalini Research Institute and assistant professor of medicine at Harvard Medical School. This supervision has to some extent helped me become aware of counter transference responses, and to reflect on the experience of the participants versus my own, through consultation via online methods and examining published research.

Chapter Four: Results

Results from the first set of interviews

Two main themes were generated in the seven initial interviews:

1. Vulnerability to a trauma response
2. Resilience

Within these two themes the following sub-themes were generated:

1. Vulnerability to a trauma response
    - 1.1 Childhood trauma
    - 1.2 Adult trauma
        - 1.2.1 Birth/pregnancy trauma
        - 1.2.2 Other trauma (car hijacking, unexpected death of a spouse, motor vehicle accident (MVA))
    - 1.3. Labile emotions
    - 1.4. Trauma symptoms
    - 1.5 Disconnection from the body
2. Resilience
    - 2.1. Spiritual/meaning systems
    - 2.2. Desire to heal
        - 2.2.1. Yoga and meditation as a tool for healing

For anonymity, participants are identified using an alphabetical letter accompanying their quotes. Quotes are used to illustrate identified themes. For brevity, quotes from only four participants have been included although in most cases there have been more than four participants reflecting the theme.

Key: Participant A = PA, Participant B = PB etc.

1. Vulnerability to a trauma response

The theme of vulnerability to developing a trauma response emerged in an initial coding through a process of identifying a clear division between past and present conditions for each participant. All participants reported emotional vulnerability linked with their experience of trauma in adulthood. Participants reported labile emotional states, trauma symptoms, and disconnection from the physical body. For most participants this was combined with multiple adverse childhood experiences (ACE). Reported adult trauma took the form of incidents such

as repeated motor vehicle accidents (MVA), a car hi-jacking, the unexpected death of a spouse, or a traumatic previous birth. For most of the participants these incidents occurred in a context of ongoing emotional or physical abuse in their intimate and/or close familial relationships.

1.1 Childhood trauma.

The past/present division provided further categorisation for some participants into childhood traumas, such as witnessing intimate partner violence (IPV) between their parents, substance abuse and mental instability in either or both parents, witnessing the death of a parent, experiencing childhood emotional, physical, or sexual abuse – and often more than one of these sub-categories simultaneously.

"My home was very very traumatic. My father was very abusive, very abusive towards me, often for no reason...Physically, emotionally...So it was very traumatic on the body…the body's been a place that I have been out of because of that trauma." (PA)

"He would hit her. He would tell her she's wet and she was wrong for being wet... he would use it to abuse her or to make her feel like it was a dirty thing… We used to also be beaten up all the time if he was fighting with her so all I know is an abusive father…" (PB)

"there was…quite an abusive relationship between my parents… heavily drinking dad ... very bad mental health in my family, some psychosis…there was childhood sexual abuse as well….from my dad…the dysfunction in my family went on for a long time…" (PC)

"…the relationship I have with my mother is very tense a lot of the time…then had the car accident at 16…I've always just had to be a lot stronger than I think I was capable of being and because my mum…I don't think she really saw or felt any of the tensions that I was having with myself..." (PG)

1.2. Adult trauma.

1.2.1 Birth/pregnancy trauma. All four participants who were pregnant for the second time had experienced traumatic births in their first pregnancies.

"I still have that trauma from Chris Hani, you know, at Baragwanath…when I gave birth to the twins and… they put student doctors on me and things like that and so…although I survived I don't want to be violated like that again." (PB)

"I got to 10cm and then all hell broke loose…I think I didn't have enough support. I didn't expect it to be as um intense as it…when I got to 10 cm…I couldn't do it…I'm like, no! I can't do this…Yeah. I just…. yeah…checked out. Completely…out." (PD)

"…and then she said, she's not breathing…the midwife…resuscitated her for 15 minutes…one of the sites of the trauma is to do with the different interpretations of that moment… on my parent's side … a very staunch Christian interpretation of her birth being a sort of punishment for them condoning a …(sighs)…evil? or non-Christian lifestyle? …" (PE)

"So when I got out of the bath I started saying, I can't do this. Like, am I doing it right? I don't know what I'm doing… I can't do it, I can't do it, I can't do it …I was being quite vocal, I was screaming but then I started like screaming… like out of terror." (PF)

1.2.2. Other trauma (car hijacking, unexpected death of a spouse, motor vehicle accident (MVA)). Five participants reported symptoms arising out of experiencing adult traumas, such as the unexpected death of a spouse, repeated MVA, car hijacking, IPV, and emotionally toxic relationships with the biological father and family members.

"…it was highly traumatic for me to find out that I was pregnant…when…I notified him…I want nothing to do with you or the child. You're crazy; you're trying to trap me…what that instantaneously did was bring up all the repressed trauma from my father…. and so my father, and the baby's father…have very similar vibrations and frequency." (PA)

"…my father and my stepmother have reacted really badly…a lot of hostility from my close family and I feel quite isolated and quite alone…the baby had been conceived over a couple of days…I was quite wasted and there was some stuff that happened that was non-consensual..." (PC)

"…my whole life is kind of separated because of everything I've gone through like the death of my husband…and then the main PTSD thing comes from a hijacking I had, so there are routes that I can't take, I get anxious on, on bridges, I can't go to certain places." (PD)

"…and then I had a car accident myself; three of them…Last year…all head injuries…because it's been in the same place its caused bruising on my brain, which then caused…frontal lobe epilepsy…I was in hospital for epilepsy and a month later I was in a psychiatric institution." (PG)

1.3. Labile Emotions.

A third subtheme was difficulty managing emotions, and the experience of depression, either clinically diagnosed and medicated, or undiagnosed and described as if it had been present from an early age.

"…I have been up and down throughout my life from a very young age…when the morning sickness started kicking in…depression feelings coming back and just being really moody and snappy…I'm just generally quite down…and tired…and I don't feel like I have any stores of energy…" (PF)

"…last year I went to a psychologist and she was like…I think you've probably been living with some form of depression for a really long time…I completely…go into the panics, and not being able to breathe. The way that it's been (voice shakes) for the last 8 years…" (PG)

Depression, panic attacks, anxiety, and suicidal ideation were present in some combination in all the interviews, and in some cases all four were present in the same interview.

"um, I think I'm tired of being tired…not becoming stable enough to you know, want to be in this world and want to take care of my children…They didn't sign up for…panic and constant worry and overthinking and analysing…" (PD)

The experience of being pregnant at the time of this first interview is interwoven with the presence of this subtheme, with a heaviness of mood and physical exhaustion which resonates with the theme of vulnerability to further trauma.

"Sometimes I feel overwhelmed by emotion, panicky and sad…I'm a lot more on edge than I would like to be…It's lonely. Pregnancy and me is associated in my family…especially among my elders… with crisis and admonishment for my view of the world and the practices that accompany it…" (PE)

1.4. Trauma symptoms.

Symptoms outlined in the PCL-C checklist emerged, such as avoidance of and physical reactions to triggering situations, flashbacks, irritability, anger, a feeling of being hyper-alert or jumpy, and numbness.

"I get triggered very easily…Quite violent vibration inside…um…Aggressive…I get activated a lot…contracted…and then I learnt how to be outside of the body…always disassociating and just experiencing life from that standpoint." (PA)

“I know that there is somebody inside of me that I need to connect with and and and that is my main thing…. I feel so disconnected with myself and it hurts me” **(**PB)

“I’m not good with my emotions…I can’t name them, let alone feel them…my whole life is kind of separated because of everything I’ve gone through like the death of my husband……the main PTSD thing comes from a hijacking I had, so there are routes that I can’t take, I get anxious on, on bridges, I can’t go to certain places.” (PD)

“…it felt like a death…like I was gonna die…I…chose to…give up…I think that would be the moment that triggered…the…PTSD and…the trauma…Every time I started falling asleep…my body would just physically jolt me awake. I was in shock…I felt scared all the time.” (PF)

One participant had fibromyalgia, which she believed was linked to childhood sexual and emotional abuse, as well as her later experiences of IPV and abandonment. Her experience of anxiety and panic attacks prompted the fear that she was negatively impacting on her unborn child’s development.

“I have a lot anxiety and I’ve had a few panic attacks...I’m worrying um…that anxiety might badly affect baby...” (PC)

1.5. Disconnection from the body.

Disconnection from the body was present in all seven participants. In the case of the participant with fibromyalgia the disconnection was mediated through the experience of the body as inflamed and painful, and a hyperawareness of the body’s state that was inescapable and yet fostered the dissociation from emotion.

“…my body is desensitized to a certain degree but I’m also like very aware of my bodily processes…a pain disorder called fibromyalgia…I tend to get bad flare ups…I think have things surrounding …like abandonment…and…would react quite physically…in relation to some of uh my bad experiences in relationships.” (PC)

In the case of traumatic birth, feelings of loneliness and disconnection from the immediate environment were evident.

“I was absolutely petrified…I just couldn’t be there anymore in that place…I physically collapsed on the floor, and in that moment I got the urge to push…I felt that something else

had taken over…I had given up…something else came in, and got the baby out… but it wasn't me." (PF)

In the case of disconnection from the body that stemmed from early childhood, the vulnerability to later trauma appeared to be linked to shame and a sense of inadequacy. Disconnection from the foetus, and an inability to communicate and be at ease with the current pregnancy accompanied the subtheme of disconnection from the body.

"my father…abusive and aggressive …I learnt how to be outside of the body so never associating with my reality, always disassociating and just experiencing life from that standpoint…there wasn't space for baby…at all…" (PA)

"…I suppose when you are living outside of yourself nothing is really that regular…so I've just sort of like…. let my life live itself…like not living inside of yourself and just kind of watching things happen." (PG)

2. Resilience

The two subthemes of spiritual belief system, and desire to heal emerged in this theme. Some participants believed in an inherently supportive universe; the resulting emotional strength and capacity was foundational to their process of healing. For others, the role of motherhood was their higher purpose in life, bringing a sense of meaningful fulfilment. The desire to heal was directly expressed by all the participants, and yoga and meditation was perceived as a channel through which the healing could begin.

2.1. Spiritual/meaning systems.

The sense of purpose derived in being a mother, and a renewed sense of self, generated a strong desire to heal for some participants. Where there was the experience of childhood trauma, becoming a mother had within it an unspoken opportunity to do better than was done to them. Motherhood was a meaning system, with the belief that there was a higher meaning and purpose in life for the self.

"All I know is being a mother…I know that there is somebody inside of me that I need to connect with and…that is my main thing…I do know that there are children that are supposed to be born…through certain people that get chosen to be their guide." (PB)

"I'm really forced to think about myself…because soon life won't be about me anymore… you know…children make you a better version of whatever you want to be because

somebody else is reliant on you…I've always known that's what pregnancy or having a child would do." (PG)

One participant used her experience of traumatic birth as an emotional resource through her belief in the inherent rightness of every experience, following some Eastern belief systems that view adversity as a gift.

"…my daughter was asphyxiated at birth…I learnt a lot from this process…which was very traumatic. It shifted my outlook on the world…I do feel like I have some ability to meet these overwhelming emotions when they arise, greet them and try to turn them into something else….because I still believe." (PE)

For two participants, their spiritual cosmology was based on the belief that good things are attracted through the power of the mind, and life is inherently supportive when the mind is controlled and utilised in this way.

"So the timing was almost too good (laughs), so these things do tend to happen in my life. I do like…um… put a lot of intention out there and then do receive. I'm very supported, which is lovely." (PF)

2.2. Desire to heal.

2.2.1. ***Yoga and meditation as a tool for healing.*** For all participants, the idea that trauma caused a drift from their centre was present, and yoga and meditation offered a way of coming back to a stable place within, a place that could assist in alleviating trauma symptoms.

"…and when I connected with you and read what the PTSD yoga was about I was like, no I need to…I have to connect with myself to connect with this child that's inside of me…through the PTSD yoga that, yes, as much as its conflicted but there is a certain task I have with this baby." (PB)

"I think I'm very aware that I need some kind of space that has to do with nurturing and trying to self-care a little bit…because I'm battling to do that and not really feeling like I have any support…so I know I have to engage in something supportive for myself…and for baby." (PC)

"I tended to do yoga quite a bit. Umm. I did classes last year. Umm. Not for therapy or anything like that but just for centring myself." **(**PD)

"I have been doing some form of yoga for most of my life…I want to make use of every opportunity I have to tune into the voice of both my children and their father more clearly so that we can birth and rear this baby with calm dignity." **(PE)**

Results from the second set of interviews, journaling, and feedback from yoga and meditation program

Five bodies of data were used for this section:

1. Interviews conducted on completion of the eight-week yoga and meditation program.
2. Audio-visual recordings of yoga and meditation program.
3. Researcher notes from observation of yoga and meditation program (from recordings or in-person).
4. Participant journaling.
5. Yoga and meditation instructor feedback.

Not all participants journaled equally, however the decision was made to use journaling where it existed. Sections of journaling are added where they enhance participant quotes.

Three overall themes were generated from the data:

1. Yoga and self-care
2. Relationships
3. Difficulties with the yoga and meditation program

Some sub-themes were generated in the Yoga and self-care theme:

1. Yoga and self-care.
    a. Transformation of physical, mental, and emotional states (before and after)
        i. Empowering tools for self-care

For brevity, the views of four participants are used, although in most cases the themes and sub-themes reflect the views of more than four.

Key: Participant A = PA, Participant B = PB etc.

Instructor Feedback = IF

Session 1-8 = S1, S2 etc.

Interview 2 = I2

1. Yoga and self-care

All participants said that the yoga and meditation program was helpful in feeling calmer, physically stronger, more energised, and empowered. All participants reported a marked reduction in the intensity of the symptoms reported prior to the start of the program. For one participant, her symptoms disappeared completely.

"…now I understand what the meditations were doing…they've put…an encryption or some signature…should anything…try and deter…she [I] will immediately be aware and…rectify because I agreed when I was doing the meditation …I'm doing this to remember myself I'm doing this to heal…" (PB)

"…my energy reserves have…been quite low…I…found the practice energising…I tend to intellectualise things…so to work more on the physical level…I was shifting things…in my body…so it was really interesting to give myself over to a process." (PC)

"Some days even go by and I notice that, oh actually…nothing has happened. I haven't felt…negative or anxious or panicky or sweaty…until something negative happens and I'm like oh! but I've been ok…I can be okay again." (PD)

"it's *that* process of healing from *her* birth through being present in this one…there's a shift in perception…the experiential lessons are little pegs that you…grab onto…it slows down the time…" (PE)

1.a. Transformation of physical, mental, and emotional states (before and after).

This sub-theme emerged from a "before and after" picture showing the progression of participants through viewing interviews, researcher notes, instructor feedback and recordings. Where journaling exists, the same representation of "before and after" is present. Instructor feedback mirrors participant quotes and displays weekly progression, with decreasing symptoms and an increasing sense of self-efficacy and wholeness. Yoga and meditation as a tool for empowering participants and liberating them from their sense of helplessness and powerlessness emerged as a further sub-theme.

PA: "…being so triggered…very much in the sympathetic state…trying to learn how for the very first time to access parasympathetic state...which I had no idea how to do…learning to be a lot more…accepting, and working from the parasympathetic to just receive."

PA journal extracts: “My mother is there for everyone else but me. To be honest I feel gutted…I feel more than unseen and unacknowledged…I feel not worthy…No wonder I am not seen by ancestors, I am not seen by anyone…” S1.

“Falling deeper into rest…looking at body’s habit and conditioning to continually act from Sympathetic…Flight and Fight response…Looking deeper into non-existent, unfamiliar parasympathetic state…” S7.

“…finally stood up in my truth…decided to speak up against abusive behaviour…play(s) out in 3 generations…stops here with me and baby…I recognise the guilt, the hurt, the shame and loyalty to the secret that is an abusive relationship.” S8.

Participants B, C and D either did not journal or chose not to submit it.

PB: “I…feel whole…one with myself…because I never…felt complete with just me. I always wanted to take something and put it here (points to her solar plexus) to make it fill this void… It never got filled whatever it is that I did…the more work I do with myself…it’s like water you know, and wherever I reach…it just nurtures everything about me..”

Instructor feedback clearly identifies the shift in PB’s emotional regulation as well as her increased self-confidence: “…is trusting the practice more as her system calms down…calmness shows…her body is more open…holds postures for the full length of time…facial expression has softened…” IF S4.

PF: “…they are non-existent. I feel like it was really effective…gave me some tools to use if I was feeling certain things…I had a very overwhelming sense of feeling debilitated…It felt quite severe and now its fine... I feel more empowered. I’m a different person…stronger…”

PF’s greatest sense of transformation lay in her feeling able to paint again (which arose during the yoga and meditation program) for the first time since experiencing the traumatic birth of her first child. She also began to play the piano again.

PF journal extracts: “My overwhelming feeling is that I want to move on. Move on from birthtrauma emotional stress working through feelings. I want to get on with it (life). Almost feeling a little stagnant. I think I’m going to paint.” End of the yoga and meditation program.

PF’s journal extracts display an increasing sense of wellbeing and self confidence in being able to manage her symptoms: “I am breathing better. I feel the meditation helps relax +

invigorate me. It almost seems a switch flipped overnight and I am suddenly back to myself. Feeling such relief." S4.

"During the yoga this week I felt my blood pressure drop + I breathed through it and managed to stay calm + then it regulated quickly." S6.

PG: PG started the program late in her second trimester and thus half of the yoga and meditation program (from S5) was in her third trimester: "I'm not always able to connect my thoughts with my body…through physical activity I can do that…which the yoga was nice for…before it was not at all possible…once I started hyperventilating my brain just gives up…so I think it's been good…and with the journaling…thinking about myself differently…reminding my brain not to be so self-deprecating…helped a great deal."

Short extracts from PG's journal indicate an increasing sense of ease and calm, coupled with better management of thoughts and emotions.

PG journal extracts: "…constantly inundated with thoughts…breathing techniques gives me a bit of anxiety…don't enjoy doing things that I fail at. I'm immensely distracted…can't wait until my five-minute timer goes…generally uninterested in practising." S1.

"My one new belief…I AM GOOD ENOUGH AS I AM…all I know is that I feel physically more invigorated and inclined to love myself and remember that I'm good enough after a yoga session." S6.

"Yoga could be the best start…opened me to the fact that I deserve better…I have my unborn son to thank for pushing me to see beyond the negativity and past circumstances or traumas to become a happy and solid mama." S8.

1.a.i. Empowering tools for self-care. The process of transformation from "before" to "after" was facilitated using yogic "tools" – a word used frequently by all participants. The participants described the tools as empowering, and instructor feedback reflected this shift in self-confidence.

Journaling, suggested as a home segment tool, was done by only some participants. This is addressed in the 'difficulties experienced' theme as being challenging for all participants, either mentioned in the journaling itself, or implied in the lack thereof. One participant who journaled chose not to share it.

PA: "…pranayama has an element of action…there's a lot more vitality in the body…it's been very beneficial…symptoms have changed dramatically…there's more space in the

body…Kriyas for opening the heart centre…crucial for relating with others, with self, the body, with baby…stepping more into one's power…profound."

PA journal extracts: "Woke up internally chanting…immersed myself in this feeling…meditated with deep breathing Sat Nam to calm the body." S1.

"…learning how to receive, allow, introduce vitality in this body…Using pranayama to sleep and calm body…Very helpful to open up…bring vitality…calm agitation." S3.

PC: "I feel quite empowered…I have a set of tools to assist me…found the practice energising…having a toolkit…space for ritual…panic attacks have substantially decreased…breath work was really immense for me…those panic attacks…that shortness of breath…felt like somehow working on the same level…having the tools lessens the anxiety…I can turn up for myself which is quite empowering."

PE: "I was more in tune…I drew on it daily…its tools and language to process feelings…that you're learning…spiritual tools…supportive habits…what happens with those is that everything becomes not so um… dramatic. It's not as dire…it's a perspective that you step into the day with…when you look at stuff…it's about choice…you can slow down…"

"…these sessions are the tools she is holding to carve out her goal…actively engaged with her breath…working with rhythm as a way of engaging in the practice…" IF S3.

"…commitment to her daily practice…owns the journey as a continued experience rather than a weekly visit…hesitancy still to commit fully to the practice and to trust the process…" IF S4.

PF: "…if I was feeling…anxious…I would use some of the breathing…I now have a…toolbox…I have experience with those things working and having an effect on me…definitely a shift…I'm not getting sucked into…thoughts of *over*reaction and intense emotion that like fogs my…thinking…finding resources…there's a resilience that developed..."

PF journal extracts: "…I am breathing better…I feel the meditation helps relax + invigorate me…Feeling such relief." S3.

"I enjoy the feeling in my body when I chant this meditation. It is very soothing, almost addictive. I find myself randomly chanting often. I feel happy." S4.

"I want to move on. Move on from birthtrauma emotional stress working through feelings etc I want to get on with it (life). I think I'm going to paint." S8.

2. Relationships

Relationships shifted during the yoga and meditation program for all participants; either their relationship with themselves, their unborn child, their families, colleagues, or ancestors. For some participants shifts occurred in more than one of these categories. Journal extracts are used where they reflect the content of the second interview.

PB on relating to immediate family members: "The more I worked on these issues that I had…the more it reverberated to the spaces that needed healing in my life…my aunt, my father, my mother, my sisters…conversations began, healing began…still today…the healing is continuing."

PB on relating to her ancestors: "…cultivation of relationship…a lot in my lineage (is) unresolved…I'm the bridge…PTSD yoga helped me connect with my ancestry…I'm listening to my mother…my grandmother…my great grandmother…these women that are saying I'm here for you…you also have to step into your power…"

PB on relating to herself and the biological father: "I'm doing this to equip myself…to understand when I'm feeling a certain way that is not one with me…identify where it comes from…if it makes me feel violated… Should he decide to walk out…He must walk out just him, just his stuff."

PC on relating to her ancestors: "…ancestor lineage work…complicated feelings…My family has always been very dysfunctional…quite overwhelming at first…so profound…can connect to my lineage while still acknowledging that in real life people might be arseholes…as a white person…almost felt like I shouldn't connect to my lineage…KY yoga…first probably active addressing of my lineage in that way…different way to think about…family…quite reparative in some ways…"

PC on relating to immediate family and herself: "…difficult interface with my father and stepmother…feeling quite isolated...it doesn't matter how much bullshit they bring…I'm going to keep responding in a way that generates love…not always how I've been able to act…I am still able to distance myself from the poor action of others. That feels quite significant."

PD on relating with other people and her daughter: "…my relationship with myself is a lot better…makes my relationship with other people way better…I have interest in other people's lives, especially my daughter…it's a big improvement…"

PD on relating to herself: "…the only way that this child could have come through to the earth was through me, so that has given me a purpose…calmed me way down…even if it's just the beginning of my greater purpose…I might as well just get out of my own way so I'm looking forward to it…it's going to be ok and if it's not ok it's not the end…yeah…."

PG on relating to herself: "Opening up to myself…thinking about myself differently…reminding my brain not to be so self-deprecating…not as easily susceptible to those feelings…able to choose when to give into it and when not to…the irritability and anger…that is reduced…it's not so much a part of my life currently."

PG journal on relating differently with herself and others: "I AM GOOD ENOUGH AS I AM…writing myself positive affirmations and posting them in places that I frequent around the house…done my best to be present…overall desire to be kinder with myself…let go of…pain and redundant negativity…letting go of the constant fear of disappointment or disappointing others…of inadequacy…"

3. Difficulties with the yoga and meditation program

The final theme to emerge was that most participants mentioned experiencing difficulties during the program, either in their journals or in the second interview. Some did not do any journaling and others did their journaling sporadically, giving it up after a while. Many participants mentioned difficulties with the breathwork. The implications of this are addressed in the literature review and in the discussion. As anxiety, and particularly panic attacks, are so intricately linked with breathing, it is not uncommon for people experiencing these symptoms to struggle with controlling the breath.

PA: "I don't know if I'm gonna continue journaling…I will try…Right now I don't feel like it…the 8 weeks was that…watching…journaling also helped that…now not journaling so much…I have a…support system…easier to do as opposed to journal…"

PA journal extracts: "Ugh triggered now for not being seen in class with (instructor) and a set program being pushed on me instead of personalised authentic heartfelt, engaged programme…"

"…the thought of having a session with (instructor) brought…strong defence driven feeling about how I will respond and act to being asked about the week…thoughts of not being seen and heard…stem from an old habit of not allowing support and guidance (to an extent) because/until I am seen or felt or heard."

PC did no journaling; cross-checking instructor feedback, recordings and the second interview provided a broader understanding about the challenges and difficulties she experienced during the program.

PC: "…my bodily capabilities…not very high…so sick during my pregnancy…working full time…I'm quite exhausted…when I first started doing the breath work…I would almost have panic about not being able to get enough breath…difficult experiences with the breath work…around like having to let go a bit of control…"

Instructor feedback reflected the challenges mentioned in the second interview:

"…painful body conditions challenge her to keep any pose for an extended period of time…" IF S1.

"…became pained and restless…says segmented breath causes her anxiety…mental restlessness is making it hard for her to create time for the home practice…" IF S2.

"…in great pain…chronic inflammation…struggling at present with diarizing and…home practise…pranayama caused intense nausea…" IF S3.

PD:

Instructor feedback indicated extensive journaling, but PD chose not to share this. PD was the least specific about the nature of the difficulties she experienced during the program, mentioning it only once. Instructor feedback and recordings put together a more complete representation of the difficulties experienced.

"…it was quite difficult…it kind of got down to the level of, why am I panicking, should I be panicking, can I not panic…" PD in I2.

Instructor feedback gave a more complete picture of the nature of the difficulties:

"…breath cleansing seemed to stir up some emotions…caused tension in the body. During the alternate nostril breathing she became shifty in her seat." IF S4.

"…seemed to be annoyed and/or somewhat overwhelmed by the mantra." IF S7.

"…not as partial to mantra as some of the other participants…makes her uncomfortable…she noted a great and persistent difficulty with the alternate nostril breathing." IF S8.

PG: "…journaling process was on and off…still struggling a little to do it (home practice) by myself…I can't concentrate as long with the meditations…I don't think it's really filtered into my relationships…it's still quite disjointed... I'm either doing yoga and doing the journaling, or in my real life."

PG's journal extracts: "…the breathing techniques gives me a bit of anxiety…really don't enjoy doing things that I fail at…I'm immensely distracted…can't wait until my five minute timer goes off so I can feel relief...quite distracted and disconnected from myself and my body during this week's session…body felt stiff…couldn't calm my mind…uninterested in practising."

Results from third set of interviews and PCL-C checklist

Two bodies of data were used for the results on the third interviews:

1. Interviews conducted between thirty-six and thirty-eight weeks of pregnancy, depending on participant availability.
2. PCL-C checklist data gathered before the yoga and meditation program started, and again at the third interview.

Three themes were generated from the data sets:

1. Self-reported symptoms resurfacing in third trimester
2. Yoga and meditation program impact
3. Improved PCL-C profile

Sub-themes were generated in two themes:

1. Self-reported symptoms resurfacing in third trimester
    a. Exhaustion and labile emotions
2. Impact of the yoga and meditation program
    a. Difficulty practicing alone
    b. Relationships

Key: Participant A = PA, Participant B = PB etc.

1. Symptoms resurfacing in third trimester

Some initial evidence suggests that PTSD symptoms increase in the weeks prior to delivery during pregnancy (Onoye et al, 2013). All participants reported the resurfacing of some

symptoms in the third interview (36 to 40 weeks pregnant), although the symptoms were experienced as more muted than before the yoga and meditation program.

"between that time and this time…my nervous system started being quite…anxious…constantly…anxious…not panic attacks…but deep…so much so that I decided I needed more support…I couldn't find balance…I got some homeopathic remedies…" (PA)

"…everything is overwhelming at the moment…started remembering how I gave birth to the twins…I still have that trauma…the idea of giving birth with a Caesar…freaks (puts both hands to either side of her head)…doesn't sit well with my psyche…overwhelmed by having to make more choices than what I have capacity for…I need my mind and my body to be in the same place…" (PB)

"…very pressurised environment…uterus lining started to calcify…battling with addiction…been smoking…they want to deliver early…I've had to go in for stress tests every week…stress test levels have been really bad…so anxious that they're going to rush me and say baby must come out…so anxious about the implications of baby showing stress, and this obviously causes stress…I'm in that kind of a space where I'm really anxious…" (PC)

PD received a diagnosis of gestational hypertension from her doctor towards the end of her third trimester and her medical team was leaning towards inducing the pregnancy early.

"…my high blood pressure probably occurred because of all of the pressure of my thoughts. I'm going through a lot of recurring of the symptoms I had…the blood pressure could perhaps be related to being tense and stressed…doctor did say it was definitely stress related…I'm thinking about the birthing experience and everything else… he thought it would be best to look at induction and just getting the baby out…" (PD)

1.a. Exhaustion and labile emotions.

Participants repeatedly spoke of being tired and emotional; some were experiencing difficult physical circumstances which added to the exhaustion and emotional lability.

PC's relationship with the biological father became very volatile towards the end of her pregnancy.

"…very, very difficult for me. I am just exhausted…lot of pressure from my work environment…lot of stuff going on in my personal relationship…I don't have any support…self-blame…very high stress levels and smoking…needing to survive some very

bad situations…then kind of beating myself up a bit…maybe that's why I'm pointing to the tension…because it's like…I actually feel frustration…I'm so sincerely trying to heal…all of this *mess* is just like surrounding me" (PC).

"Grasping…aware of being overwhelmed…ya trying to control it…I'm petrified of going to the public health care…the thought of giving birth on my back feels like it's going to be the end of me…this doctor who said I should have a caesarean…that has upset me..." (PE)

"…all over the show…feeling emotional about the changes that are coming, the journey…generally I'm all over the show. I'm crying a lot, feeling a sense of urgency to get everything ready…and tired…feeling sensitive…been intense, really intense, emotionally…It feels like it's been a challenge. It hasn't felt easy." (PF)

"My body is really just making me miserable…lack of sleep is really getting to me…I'm just tired and achy…" (PG)

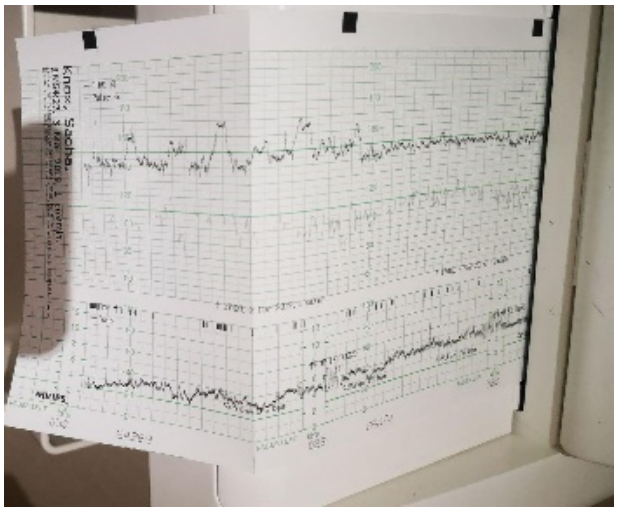
2. Impact of yoga and meditation program

The yoga and meditation program was experienced as being particularly useful in different ways, and participants expressed how they were still experiencing the impact in their third trimester. For one participant the second and third interview had to be held close together due to the late start of the yoga and meditation program in the last four weeks of the second trimester, but for the others the third interview took place months after the eight-week program.

PB: "…what I learned and experienced there in the PTSD yoga helped me…stay contained and inside, not in the stickiness, not into the emotions…the turmoil…When I did the meditations…I shut everything out…cultivated that concentration and focus…that's my training for now...me and baby must work together my focus needs to be *there*... Just like the meditation I can't be wandering off…connecting with the ancestors, connecting with the higher power…that was most of…the work that was being done…"

Figure 2

Stress Test for Participant C



The stress test for PC shows how the breathing exercise calmed the baby's erratic movements.

PC: "I've had to go in for stress tests every week…My stress test levels have been really bad…I'm in that kind of a space where I'm really anxious…during the stress test when baby was showing…erratic movements…to indicate…stress on the baby…I was able to start meditating and breathing and then things totally mellowed out…maybe 10 seconds after I started doing that everything just… flattened out. It was like…such astounding evidence of like how quickly your body can be affected like just by engaging with stuff."

PD: "The blood pressure. Completely. Calmed down. It was fine. It was stabilized. It was just that my doctor thought maybe it would come back because of the lack of support that I had, he thought it would be best to look at induction and just getting the baby out but the breathing completely changed the high blood pressure so I could fight it a bit and I didn't get induced."

PF: "Feel like I've sorted through a whole host of stuff. I mean like, like big work...emotionally…I have a tool to use when I'm feeling particularly anxious or unsettled…I don't feel so reactive…a better awareness…I don't feel like that trauma is in my body as much as it was…I don't feel attached to that part of the experience at all…don't feel the need to tell anyone about it, or talk about it anymore, or think about it…I feel like released from it…I mean it was hugely valuable. It was really one of the most effective things I've ever done in terms of a therapy."

2.a. Difficulty Practising alone.

Due to considerations with the Wits Ethics board, the yoga and meditation program was held during the second trimester of pregnancy. Participants expressed how difficult it was to continue practising without the guidance and structure of the weekly classes, guided journaling, and support of the instructor into their third trimester. As all the participants experienced a resurfacing of some of the self-reported symptoms present during first

trimester, the sub-theme of difficulty practising alone emerged once the ongoing support of the yoga and meditation program ended.

PD: “I was trying to figure out which exercise to do from what I could remember. I was looking through notes and I didn’t quite know which ones would help…it was difficult to remember which ones to use at that point. It would have been useful to have been doing the therapy programme perhaps all the way through….And that accountability… because it was consistent and then you had somebody to do it with you and make sure that you were doing it right.”

PE: “…there’s the…daily practice which I’ve fallen out of…or I fall in and out of, with the new arrangement…The daily practice...a lot of being about this mother is about that mundane stuff and then again in this context, that stuff’s happening alone. The individual experience…alienating…like…a lot of *you* disappears.”

PF: “Physically as well it’s been very challenging coz I feel like it’s been a long time since then, and yeah, again just up and down. It feels like it’s been a challenge. It hasn’t felt easy…I’m not very self-disciplined but I don’t think I used it as much as I should of…or could of. So I feel that it probably would have been beneficial…more of an on-going…in terms of feedback…it probably would have been helpful to have more consistent direction as to what to do, and how to use it…So yeah, maybe that initial eight weeks of whatever and then maybe every second week, or maybe every week.”

PG: “I think some of those things are replicating themselves, now that I’m always frustrated, and to practice some of the stuff that I learnt by myself, I’m just like really distracted honestly…I’m still struggling a little to do it by myself though.” (PG)

2.b. Impact on Relationships.

Relationships as a sub-theme was verbalised as part of the impact of yoga and meditation program, with some participants attempting to forge/repair their relationship with the biological father, and other participants experiencing a greater degree of self-regulation in their relationships with their families or partners or finding support in community. In the case of two participants, their relationships with the biological father continued to be abusive and/or responsible for the re-emerging of old patterns of behaviour and further trauma, and the skills learned in the yoga and meditation program assisted in creating some level of support, allowing the trauma response to be somewhat mediated.

PA: “I really needed to step into my truth and be seen by my community…a lot of the people haven’t really seen me as I am, they’ve kinda mostly seen me as ill or on this path but not truly…empowered…baby and I both need it…a lot of the stuff we did in the eight weeks, was, how do you ask for support…a lot more tenderness…self-compassion is coming in, and also just verbalising where I am rather instead of verbalising from a very contracted space…”

PA’s relationship with her mother, previously tense and experienced as being unsupportive, has shifted to a gentler and more receptive space.

“…that’s where the most tenderness has come from…our relationship was quite…polarised…and, in this process…It’s come to balance …” (PA)

PB’s relationships, with the biological father, her aunt, and her children, was the central focus of the third interview. The biological father had recently moved in with her and her three other children, from different fathers, and they were trying to create a blended family.

“…well the father is around…he wants to really participate…but he comes with his own things… I have to…clean after him and things like that...and I’m not used to that…it’s a shift, having to accommodate a male…but with intention to be in a union…it’s a bit difficult….(laughs tiredly, and sighs) ya, it’s a bit difficult towards the end.”

PB’s relationship with the aunt who raised her has continued to shift into places where they have a more wholesome and even supportive communication.

“…I had issues with my aunt...but now it looks like we are ok…she asked me how I was and I said I’m hanging in there and then she said hang in there, just relax, pray, reflect, recollect all good things past and present, any conflict you’ve had, pray, resolve, apologise, pray, relax and release you know… ”

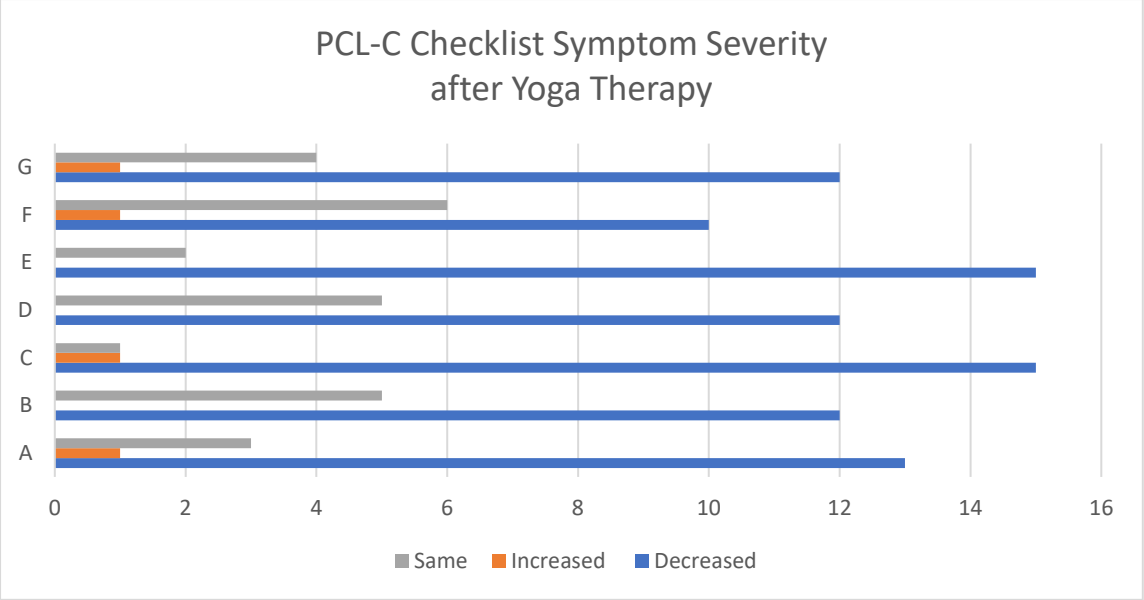
PE: “…in the absence of that physical community…this thing…it has the capacity to elevate…at the level at which there is community even though it’s not physical…And then the other thing they do is they put less strain on your relationships…when you are carrying so much…when you start looking at yourself, then you need less from people…and less desperately…You in community, and that is where my growth and understanding of…the kundalini approach...lies…to what extent do you let go and to what extent do you hold people to account.”

PF: “I feel like with me and (Husband) I have like matured…in my reactions to him…he would trigger me, and I wasn’t aware that it was a trigger, and would think it was him so now I’m kind of trying to like own my own stuff…I do feel more in control and not as dependant on him for my emotional wellbeing which I was, which has kinda like been the nature of our relationship…I think it’s just helping me cope…I’m a lot more needy than him…and now I’m getting to the place where…I can feel less needy of him…”

3. Improved PCL-C profile

Across all participants there were thirty-two items where the response decreased in cluster C (items 6-12), which describes avoidance symptoms such as avoiding thoughts, disturbing memories or activities that are reminiscent of the traumatic event. The second highest number of reduced symptoms (twenty-nine items) could be seen in cluster D (items 13-17) which describes nervous system arousal such as jumpiness, irritability or trouble sleeping. Cluster B, which describes re-experiencing of memories, thoughts, or dreams of the traumatic event, had a total of twenty-seven items that improved for all participants. Four items increased in severity for four participants and all four items were in cluster C. Twenty-five items remained the same, with no change, across all participants. Thirteen of these items were in cluster C, eight in cluster B and four in cluster D. The summary of changes detected by the PCL-C was 74% of the items improved, 21% stayed the same, and 3% of the items increased in severity.

The graph below identifies the overall decrease, increase or lack of change in their symptoms, as measured by the PCL-C checklist, for each participant at thirty-six to thirty-eight weeks pregnant.



Results from fourth set of interviews

One data set was used for the results on the fourth interviews:

Interviews conducted between eight and twenty-four weeks after birth, depending on participant availability.

Key: Participant A = PA, Participant B = PB etc.

Three themes were generated from the data set:

1. Stressful pre- and postnatal period
2. Using yoga tools during labour
3. Overall impact of the yoga and meditation program

1. Stressful pre- and post-natal period

All participants experienced the first two weeks after birth as particularly stressful, especially participants giving birth to their first child.
For PB the stress continued beyond the first few weeks due to unemployment and losing the home she had shared with her four children. (The weeks preceding the birth were also intensely stressful due to a turbulent relationship with the biological father).

"…everything of mine is segregated. Like I'm not staying with my kids, I'm not staying with my aunt and it's very painful…It's stressful…I'm trying to figure myself out…I thought I was on a crossroad when I lost my place, and everything…So I'm being torn apart. I'm losing everything. Like everything is shedding. It's very painful. So I'm there."

PC's fourth interview took place 24 weeks after giving birth. PC had been trying to live with the biological father from towards the end of her third trimester and the abuse from that relationship intensified during that time, resulting in a stressful period immediately preceding birth and afterwards. The biological father stayed until two months after birth and then cut off all contact.

"…I have bad postpartum symptoms and rage is one of those symptoms…like directly after birth; a lot of weepiness…Every time I breast-fed I would start pouring with tears…And then because he was around for the first 2 months when baby was born…there was some moments right after the pregnancy when I felt a little bit on the brink of psychosis…so I did go on medication…but then there were quite intense things…where I thought he would break my finger once…that happened in front of baby…remembering it, it was just a terrible terrible time…"

PF's first experience of birth was traumatic and although the second birth was all she wanted it to be, the first weeks after birth saw her experiencing a resurfacing of labile emotions.

"It's been up and down…a million different emotions every day…in the last week, I've been feeling a little bit more stable. But emotional…I have increased my 5htp…the first 2 weeks were, it took me a long time to come back (laughs) to earth…and having to be here with (first child) and having to kind of like be functional from early on…I was like, I just have to do something, cos I could feel myself… not slipping, but like feeling a bit down, like that old chemistry just creeping back."

PG experienced stress during her birth process. As soon as she was strapped to a heart monitoring machine, she began to experience anxiety and stress. She had to be scheduled for a C-section due to not dilating enough and felt a loss of control during the procedure. The C-section physically impacted on the time directly after birth.

"…as soon as I heard his heart rate going up…mine went up…I was just thinking of the worst…the more I thought, the more anxious I got, the more his heart rate went up and I was just like somebody needs to turn that off…I was fine for the time that I was by myself…when the epidural wore off that was awful…I felt really debilitated, and I have to reach like this to pick up the baby, and oh please can you, please can you…especially when I got home…the living place was downstairs…I felt like a prisoner up there…I couldn't do anything without painkillers for like 3 or 4 weeks…so that wasn't very nice…"

2. Using yoga tools during labour

All participants spoke about using yoga tools as an assist while going through birth contractions, vaginal birthing, or a C-section.

PA: "…a lot of pranayama, breathing downwards…Helping to breathe the baby out…throughout the pranayama technique of breathing into the navel. One of my favourites…you breathe in through your mouth, out your nose, out your nose, in through your mouth…I used that quite a lot…my birth was very very meditative…accessing the body, breathing into…allowing all of the contractions to be there. Not being overwhelmed…allowing baby to birth itself. Breathing baby out."

PC: "I definitely did breathing. It was quite an intense experience…They just took me in. I was just trying to negotiate that and then they just took me in…Thank goodness I had a good anaesthetist. Definitely started to feel pain halfway through it and I know with the C-section you feel pressure but it was becoming not just pressure it was pain so then I got additional pain medication. All the way through this I was using the breathing."

PD: "…I wasn't experiencing any panic or worry or anything. I was just waiting to experience it…but it actually didn't…I was doing a whole lot of breathing…especially with the contractions…I was inhaling through my nose and out through my mouth as the contractions went bad…I was sitting down, I was looking around and I was breathing…Yes. I really underestimated that more than anything else."

PE: "…like serious sensations with the contractions. I never felt the contractions in the way that I did with this. And I think it's quite dangerous to numb pain…when that is what is guiding you…I could understand there were these waves but with the tools that I had I was riding them, I was trying to stay on top of things…And that's the major thing is this perspective…because if you can watch it then it's not….because it IS, it's incredibly painful….but you can watch it, and you can know it."

3. Overall Impact of the yoga and meditation program

The time period between the end of the yoga and meditation program and the fourth interview varied between 16 weeks, for the participant who started the program during the last 4 weeks of her second trimester, and 42 weeks, for the participant who started at 14 weeks pregnant and was not available for the final interview until 24 weeks after giving birth. Despite the difference in time periods the theme of the overall beneficial impact of the yoga

and meditation program was present for all participants, lasting long after the end of the program.

PA: "Supported a deepening, an allowance of what was occurring. It gave physical actual tools of being more embodied in the experiencing. I think it also allowed for a lot of things to come up that perhaps were blocking my ability to be a little bit more embodied…I spent hours and hours just not being able to be in the body. Now not so much. I'm able to be in the body…Being able to be present to it and having everything there because I used to slip in instead of slipping out."

PB: "…I…would sleep if I wanted to deal with stressful situations…I don't do that anymore…Now I question the self…That's shifted a lot…PTSD yoga…helped me connect with (baby)…there was a lot going on…so it was hate it was despising..wanting…to abort…rejecting the baby…PTSD yoga turned it into…an injection that I needed to…take in and feel…accept the baby…With everything that I experienced I was able to face it head on…I don't have any trauma from my pregnancy, from the minute we started the PTSD yoga, I have no regrets, there's nothing that I can say I regret."

PD: "…interrogating thoughts. I think that always helps…The thought just keeps coming back so the next step is to ask yourself if this is actually true…that exercise in particular helped with just shifting thoughts…The mantras…helped…gave me like a higher power. It wasn't just me there was somebody or something…looking after and protecting me. I just didn't connect with it and I think with the yoga and meditation program I connected with it and I believed in it…so it's not in my body anymore…I don't get sweaty palms or palpitations or just that general state of panic you know."

PG: "I can absolutely feel the difference…I wanted to get involved more for the birth…not having anxieties around that, and not regretting the way that it happened…I think the mental state that I tried to put myself into, every time I would do yoga has really helped…Yeah. I really like want to go back…steal an hour or two here or there…"

All seven participants felt that the yoga and meditation program was beneficial for the reduction of symptoms of PTSD as measured by the PCL-C checklist. While all participants experienced some difficulties with the program, Participant A experienced the most resistance, observed in her journaling, recordings of sessions, and instructor feedback. Despite this, her symptom report showed a marked improvement in her self-reported symptoms even ten weeks post-birth. Difficulties with the program and whether the

requirements may have been too demanding for some participants is considered in the discussion.

Chapter Five: Discussion

The research study's overall aim was to explore the experiential engagement in yoga and meditation and the impact thereof on the self-reported symptoms of PTSD during pregnancy from the perspective of seven South African women in second trimester. Questions guiding the research explored the impact of PTSD symptoms on the experience of pregnancy, perceptions of yoga and meditation and any possible impact on the experience of pregnancy and birth, and PTSD symptoms. The participants were not representative of all pregnant women in second trimester who self-report symptoms of PTSD, and thus the findings of the study cannot be generalised to this population (Finlay, 2006; Mellon, 1990, cited in Westbrook, 1994;).

The longitudinal nature of the study produced results at four stages of the process: before the yoga and meditation program, after the program, at thirty-six weeks pregnant, and from eight weeks to six months postnatal, depending on the availability of the participants.

Results

First Interview

Trauma. Before receiving any yoga and meditation sessions, results showed a two-fold response to the interview questions. The first response, connected to trauma, was foreseeable as all participants had a PTSD profile, measured on the PCL-C checklist. The second response, connected to resilience, was less predictable. Participants all displayed vulnerability to trauma from having been exposed to childhood and/or adult traumas, and were thus vulnerable to further traumatisation (Horesh, 2012; Titchener, 1986; Uddin et al., 2010), possibly during the upcoming birth. Four participants experienced a combination of childhood sexual, physical, and emotional abuse and were thus particularly vulnerable to re-traumatisation (Herzog & Schmahl, 2018). All four participants had experienced further traumatic events in adulthood. One participant experienced repeated MVAs resulting in traumatic brain injury, epilepsy, and psychiatric hospitalisation. The second participant experienced repetitive IPV in her intimate relationships, and the conception of her baby was during non-consensual intercourse. The third participant experienced consecutive abusive intimate relationships and abandonment by the biological father of her unborn baby, and the fourth participant had experienced two previous traumatic births, consecutive abusive relationships, and abandonment by all the biological fathers of her children, including the

current pregnancy. The remaining three participants had experienced previous traumatic births. One of the latter had also experienced the unexpected death of her spouse and a car hijacking. Symptoms described comprised labile emotions including depression, anxiety, and panic attacks, and trauma symptoms outlined in the PCL-C checklist clusters, such as those related to avoidance, hypervigilance, and re-experiencing. Feeling disconnected from the body was a common experience for all participants.

Resilience. Resilience was connected to meaning making, either from finding a sense of meaning in impending motherhood, or within a spiritual belief system acting as emotional scaffolding. Finding a way to integrate a traumatic event into a broader belief system is recognised as an important component of recovery from trauma (Horn et al., 2016). A desire to heal was common among all participants prior to joining in the yoga and meditation program, in addition to faith in the capacity of yoga and meditation to bring about their desired healing.

Second Interview

Results from the second interview, eight weeks later, highlighted three areas.

Yoga as self-care. The first area was yoga as a form of self-care, promoting transformations in PTSD symptomatology, and affording the participants a continuously increasing sense of empowerment during eight weeks of yoga and meditation. This theme is borne out in literature addressing the effectiveness of yoga and meditation in the treatment of trauma, particularly somatic elements of trauma, not being present emotionally and physically, and loss of authentic connection between the body and a sense of self (van der Kolk, 2013; West et al., 2017). All participants mentioned the advantage of generalising the tools of yoga and meditation to when they felt threatened by their symptoms in daily life, and not just during the yoga and meditation sessions. This assisted them in feeling calmer, more energised, and more confident in their capacity to heal themselves from their previous complaints. The symptoms of one participant disappeared completely, and for the rest, the frequency of occurrence, in addition to the intensity, was markedly lower than before the yoga and meditation program.

Relationships. The second area of focus was relationships. PTSD symptoms impact relationships and social support networks, increasing the severity of symptoms and resulting in fewer and less positive social supports (Beck et al., 2009). There are few studies on the impact of PTSD on family and intimate relationships, and social support networks, and these mostly focus on veteran populations. There is an under focus in the literature on the impact of

PTSD on the relationship with the self. Chronic or complex PTSD creates disconnection with the self, feelings of shame, and lowered self-esteem (Dorahy et al., 2014). The study participants experienced distinct and often profound shifts in their relationships, including how they related to their own lineages and the lineage of the biological father. Foundational to these external shifts was an internal shift in how they related to themselves. Improvements in relating in general, with friends, work colleagues, family members and intimate partners, was supported by this internal shift. This resulted in an overall sense of wellbeing, decreased anxiety about parenting, and an improved sense of self.

The four participants who had experienced childhood abuse were especially at risk for disrupted patterns of attachment with their infants (Breidenstine et al., 2011; Carleton & Ho, 2009; Schore, 2000; Zeanah et al., 1997). On entry into the study, one participant wanted to terminate the pregnancy, rejecting her baby; she had experienced two previous traumatic births and felt completely unprepared for another pregnancy. Three participants who had experienced childhood abuse felt disconnected from their babies, and experienced anxiety and panic at the start of their pregnancies. The remaining three participants had all experienced previous traumatic births and felt disconnected, out of their bodies, panicky, and fearful. Mental illness during pregnancy is associated with disrupted attachment styles (Pearson et al., 2012; Stein et al., 2014; World Health Organization, 2015, May 13) and may expose the child to maltreatment. Previous trauma may result in the inter-generational transmission of a physical predisposition to being traumatised in later years (Perroud et al., 2014; Seckl & Meaney, 2006; Yahyavi et al., 2014; Yehuda et al., 2008). Thus, all participants could potentially have created disrupted attachment in their infants.

Though the study did not continue beyond the first few months of birth, the alleviation of a large portion of the mental and emotional burden felt by participants at the start of the yoga and meditation program indicated that the danger of disrupted attachment with their infants was considerably lessened. This indication was strengthened by favourable outcomes experienced by all participants in their close relationships, and relationships with friends and work colleagues. Supportive social networks have a negative association with PTSD symptoms (Beck et al., 2009) and this further limited the potential for insensitive parenting.

Lineage practices. The added focus on lineage practices added a healing component for participants of all South African races represented in the study, bringing a sense of greater acceptance about their own lineages, and the lineages of the biological father.

Both lineages often had indications of trauma, not unusual for South Africans, and this reflected the literature on the intergenerational transmission of trauma (Yehuda et al., 2014; Yehuda & Lehrner, 2018). The use of Western psychology with its outcomes-based and medicalised approach to trauma may not be appropriate for use in Africa, where social conditions and cultural traditions are inextricably interwoven with the experience of, and the approach to trauma (Horn, 2020). The inclusion in therapy of more traditionally recognizable practices, such as using the voice, movement, and rhythm, such as those contained in African Kundalini Yoga, may enhance receptivity, and comfort, and accelerate healing in an African context (Afuape, 2011). Moving away from an individually focused treatment mode to a group focused mode may also enhance the sense of familiarity for cultures that emphasise the collective self and healing in community (Horn, 2020). While this was not possible in this study due to factors of time and cost, a group practice of yoga and meditation for trauma survivors who are pregnant may be a useful focus. The ancestor focus that was brought into this study reflects notions of liberation psychology as described by Taiwo Afuape: "Underlying the concept of PTSD is the view of trauma as an individual-centred event confined to intra-psychic experience. For cultures that emphasize interdependency rather than autonomy, maintaining a connection to family, community, dead relatives and ancestors may be more significant than individual thoughts and feelings." (Afuape 2011, p. 52).

Difficulties experienced. The third area of focus was on difficulties the participants experienced during the yoga and meditation program. Given that most participants in the study had little, if any, long-term experience with yoga and meditation, the beginner-level program allowed participants to engage at their own pace, with invitational language consistently offering choices of alternate postures. However, the symptoms of trauma are such that people are out of touch with their bodies and thoughts (Cook-Cottone et al., 2017; Levine & Mate, 2010; Steinwand, 2017; van der Kolk, 2001) and even trauma-sensitive instructions may have been beyond the reach of some of the participants. Participants were informed of their option to leave the program at any stage, and none chose to exercise their option.

Yoga postures. One participant was afflicted with fibromyalgia and this condition exaggerated the difficulties experienced ordinarily with sitting in one position for any length of time. The yoga and meditation program was designed for pregnancy, making many commonplace yoga postures unsuitable for inclusion in the program, and requiring the use of sitting postures for all the breathing practices, meditations, and chanting. For most of the

participants who were still in their second trimester for the duration of the program, this was manageable, if a little uncomfortable, until their bodies accustomed to the postures. For the participant who was in third trimester for the last half of the program, and the participant with the pain condition of fibromyalgia, this presented a significant challenge particularly as neither had practiced much yoga prior to this study. A study that evaluated before and after vital signs, pulse, and foetal heart rate for twenty-five healthy women in advanced stages of pregnancy who did various yoga poses, established that even those with no yoga experience at all (seven) experienced no adverse effects with any of the poses (even those previously believed to be contra-indicated) for either themselves or the foetus (Polis, Gussman & Kuo, 2015).

Breathwork. The experience of anxiety and panic are intimately linked with breathing. Breathing patterns are linked with emotional states such as anxiety, and may cause the breath to become agitated, fast, and shallow (Khalsa et al., 2016). Changing breath patterns impacts on emotional states and tidal volume and can induce different feeling states (Bloch et al., 1991; Rama, Ajaya & Ballentine, 1976). Many adults have lost the ability to breathe correctly, and over a lifetime of incorrect breathing habits they develop the co-occurring emotional states that go with patterns of irregular, shallow, jerky breathing. Using the diaphragm appropriately to correct shallow and incorrect breathing leads to relaxation of the chest and other muscles and encourages a calm and relaxed state of mind (Rama et al., 1976). As with yoga postures, many breath practices that are integral to the transformation of states of mind and emotion are not appropriate for use during pregnancy, such as breath retention, or bellows breath which involves pumping the abdomen. Long deep breathing, which is not as engaging for the mind and takes some practice to do correctly, was difficult for all the participants. As all participants suffered from anxiety and many from panic attacks, changing their habitual breath patterns was a significant challenge. The lack of capacity to concentrate sufficiently to bring all the different parts of the breath exercises together, coupled with the shortened breath that is natural to many during pregnancy made this practice uncomfortable. As many meditation practices involve controlling the breath, this difficulty persisted throughout the program. However, it was also the breath practices that were experienced as being the most impactful, the most useful in controlling the experience of symptoms, and especially helpful as a tool during labour to stay present and ahead of any possible panic that could accompany contractions.

Chanting. Chanting was an integral part of the therapy, and this presented some difficulties as well, mostly in the use of a foreign language which made some participants

uncomfortable. Yet this practice too was singled out by the majority of participants as being singularly useful for reducing the impact of PTSD symptoms.

Journaling. A further difficulty experienced by all participants was that of journaling their progress throughout the program and beyond, until the final interview. Only one participant managed to journal, and this only marginally, until the end of the study, which was scheduled to end at six to eight weeks after birth. Three participants journaled through the program and then stopped after the therapy ended, and handed their journaling in, and one participant journaled but decided not to hand her journaling in to become part of the data set. The journaling that made it into the data set reflected what participants said during their interviews and reflected instructor feedback from the eight sessions of therapy, making it useful as a cross-checking mechanism.

Daily practice. An important part of the program was a daily practice at home between sessions, in addition to the journaling. This may have posed the greatest challenge for many participants as the majority were working full time jobs or had a toddler to take care of. The participants who were not working managed to be the most consistent with this aspect of the program. This indicated difficulties with finding time outside of therapy sessions, as well as finding the energy to do something extra at home. What was noticeable about this aspect was that when participants managed to keep up a consistent practice, the impact on their experience of the passage of the week was significantly enhanced in comparison to when they did not manage to maintain consistency. For those who managed to improve this aspect towards the end of the program, the effect on their self-esteem as well as on their capacity to remain focused and calm was noticeable to both themselves and the instructor, as reflected in the instructor feedback.

Third interview

Results from the third temporal point, at between thirty-six and thirty-eight weeks of pregnancy, depending on participant availability, indicated three themes.

Resurfacing of symptoms. The first theme was the resurfacing of self-reported symptoms from the initial PCL-C checklist during the third trimester. This is in line with literature which indicates that while mental health symptoms such as depression and general stress symptoms show a steady decline throughout pregnancy, PTSD symptoms show a spike in the weeks prior to delivery (Onoye et al., 2013). Despite the increase, the frequency and

intensity of the symptoms for all participants were less of a central focus than they were prior to the yoga and meditation program.

Risk factors for intensified symptoms. For the participants whose physical circumstances were unstable, such as having to move out of home just before birthing, or when the biological father's presence brought with it IPV, repeated abandonment and failed attempts to make the relationship work, their symptomatology was more intense and disruptive, particularly for those who had also experienced a previous traumatic birth. The definition of IPV includes actual or threatened physical, emotional, sexual, or psychological violence by a current or former partner (Matseke et al., 2012) and impacts the mental health of abused women extremely negatively (Pico-Alfonso et al., 2006).

Participants whose financial circumstances dictated a public hospital birth were frightened by this, particularly the participant who had experienced two previous traumatic births in a public hospital, and they also suffered from intensified symptomatology. Four of the seven participants were either in a current abusive relationship with the biological father, or the biological father had abandoned them. The experience of these participants was one of feeling pressurised and anxious. For three of these participants, physical health issues developed that threatened the pregnancy and created further pressure from their medical teams to deliver early, possibly through c-section. Participants in stable relationships and physical circumstances showed the same spike in symptoms although their experience was of lesser intensity, thus indicating that external conditions could possibly influence the spike but not cause it. This area would need more research to verify the reason for the spike in PTSD symptoms in third trimester.

Exhaustion and labile emotions. Exhaustion was a common experience for all participants, which influenced their capacity to self-regulate emotions. All participants reported labile emotions as part of their experience at around thirty-six weeks of pregnancy. Lack of sleep is a familiar feature of this late stage of pregnancy and could be partly responsible for the emotional swings reported by many participants. Physical circumstances mentioned above for some of the participants would have influenced the lability of emotions but the participants who did not experience these circumstances reported the same swings in mood, with an edge of desperation in the reporting, again indicating an internal rather than external reason for the emotional lability.

Impact of the yoga and meditation program. The second theme underscored the usefulness of the yoga and meditation program. For six of the seven participants the yoga and meditation program ended between twenty and twenty-eight weeks of pregnancy. The seventh participant started the program towards the end of her second trimester, so the third interview took place close to her thirty-sixth week but for the other participants, the third interview took place two to three months later, leaving a significant period of time after the therapy had ended. For one participant whose stress levels were extremely high and who had to undergo regular stress tests to verify the health of the baby, the use of breathing and meditation during a stress test assisted in calming the baby down. This was evident in the output of the stress test which showed a levelling off in the graphic indicator on the test, with the test acting as a biofeedback marker. A second participant who received a diagnosis of pregnancy hypertension and was warned by her doctor that she would be induced if it did not improve, used the breathing and chanting to bring her hypertension under control and avoided an induction in this manner. All participants used the tools they learned during therapy to prepare themselves for birthing and to bring their awareness and focus out of symptomatic behaviour and onto the task that lay ahead. One of the participants who had experienced a previous traumatic birth felt that she had processed the trauma and did not feel fearful at all about birthing, which was a significant relief as prior to the yoga and meditation program she was unable to move beyond the experience.

Difficulties practising alone. The difficulties of practicing alone, previously experienced during the yoga and meditation program, recurred after the end of the program. All participants mentioned that the program, which included a supportive relationship with the instructor, guided journaling and reporting back weekly on progress or challenges, was instrumental in their progress. Trying to remember what to do on their own, without guidance and support was experienced as a difficulty. Despite being able to use the tools they could remember the absence of the program was keenly felt by all participants and the majority mentioned that it would have been useful to have had a continuation of the support and guidance throughout the third trimester. Research on the spike in PTSD symptoms during the third trimester (Onoye et al., 2013) indicates the value for future research investigating the effectiveness of a yoga and meditation intervention that continues from second trimester until forty weeks of pregnancy, with appropriate adjustments for physical capacity.

Relationships. A further aspect that was highlighted as part of the impact of the yoga and meditation program was the impact on relationships. Yoga as a tool for regulating emotions and improving mood has been the subject of many studies (Felver, Butzer, Olson, Smith & Khalsa, 2015; Menezes et al., 2015; Patel, Nivethitha & Mooventhan, 2018) and results show efficacy in self-regulation, controlling impulsive reactions and improving mindfulness and self-compassion. For the two participants whose relationship with the biological father continued to be abusive and potentially retraumatising, the tools they had learned during the therapy assisted in regulating their emotions. Other participants found they were less reactive in their intimate relationships, and this allowed for increased support and connection with spouses. This was echoed by participants who were not in intimate relationships and who noticed a significant change in their behaviours within friendships, with family members and with work colleagues. This resulted in an increased sense of support and decreased feelings of isolation, both important indicators of resilience to being re-traumatised (Horn et al., 2016).

PCL-C profile. The third theme was an improvement in the PCL-C profile of all participants. The PCL-C checklist was administered a second time at thirty-six weeks of pregnancy, and all participants showed a marked reduction in their scores. The area of greatest decline was in cluster C of the PCL-C which measures symptoms of avoidance such as avoiding thoughts, disturbing memories or activities that are reminiscent of the traumatic event. The capacity to interrogate thoughts and regulate responses using breathing and chanting was mentioned by several participants as a particularly useful skill learned during the therapy. The second greatest decline in symptom severity was seen in cluster D which describes nervous system arousal such as jumpiness, irritability or trouble sleeping. The well-researched positive impact that yoga and meditation have on the autonomic nervous system, increasing parasympathetic response, explains this decline in symptom severity (van der Kolk, 2013). The move from a sympathetic nervous system response to a parasympathetic response is an integral part of the practice of yoga and meditation. Cluster B which describes re-experiencing of memories, thoughts, or dreams of the traumatic event showed the least decline. Overall, there was a decline of 74% in the experience of PTSD symptoms across all participants.

Fourth interview

The fourth and final temporal point in the study was postnatal, from eight to twenty-four weeks after birth, depending on the availability of the participant. Experiencing high stress in the pre- and postnatal stages, directly before and after birth was a common experience for all participants. A second theme that was generated from the data was the use of the tools learned during the yoga and meditation program during labour, and the final theme was a reflection on the overall impact of the yoga and meditation program for all participants.

Increased stress pre- and post-birth. All participants experienced the first two weeks after giving birth as a high stress period, particularly participants giving birth to their first child. A study that looked at the levels of stress hormones, noradrenaline (physical stress), cortisol and adrenaline (mental stress), for primiparous women pre-delivery, during labour and post-partum, found increases of more than 500% for adrenaline and cortisol, compared to 50% for noradrenaline (Alehagen, Wijma, Lundberg, Melin & Wijma, 2001). These differences indicate that mental stress is considerably greater than physical stress during childbirth, and childbirth is a stressful event for all women. Given that the participants all experienced increases in their PTSD symptomatology in third trimester, their mental stress levels could be expected to be even greater than for women without PTSD symptoms. For some participants, the continuation of the stressful and emotionally demanding physical conditions experienced before birth, together with an abusive relationship with the biological father, added to the normal challenges of giving birth. One participant lost her job and had to move out of her house just before giving birth. Even participants who delivered their babies in the way they had anticipated experienced the first two weeks as being a time of labile emotions. In another study on emotions after childbirth, anger and depressed mood (distinct from postpartum depression) were prevalent from two to eleven weeks postpartum (Gelaye, Rondon, Araya & Williams, 2016; Graham, Lobel, & DeLuca, 2002). For one first time mother, the experience of giving birth (in her case by c-section) in addition to the unfamiliar experience of taking care of her recovery from birth as well as trying to breastfeed and take care of a new-born, created the need to take medication in order to bring her emotions under control.

Using yoga during labour. For all participants, using the yoga tools while in active labour, and even to assist in staying calm and present-centred during a c-section, was an empowering experience. One participant's experience was described as "meditative…breathing baby out" which is a peak experience in birthing terms. The sense of feeling in control and able to navigate through the intensity of contractions calmly and with

an enduring capacity was described by all participants. When this failed for one participant it was due to medical interventions taking away this sense of independent control; she was strapped to a heart monitoring machine, thus forced to lie still and unable to control her own movements. This led to a sense of panic and ultimately to a c-section. All three participants whose previous births were traumatic, described their experience of birth as vastly different the second time around, due to having tools that could assist them to stay in control of themselves. This sense of being supported by the tools creating a platform of independence made the birth an experience they could shape and mould rather than one that shaped and moulded them.

Overall impact of the yoga and meditation program. For one participant the most remarkable impact was a sense of being embodied, able to feel her body once again after having spent a lifetime feeling disconnected. The capacity to identify, question and often regulate thought processes and connected behaviours was noted by several participants as a benefit they would continue to use going forward. When yoga is practised mindfully, with an open awareness that encourages being present in the body (a trauma sensitive approach to practising yoga), it encourages a "positive embodiment" (Cook-Cottone et al., 2017, p. 3), and addresses two key areas of trauma, namely dissociation and hyperarousal (Cook-Cottone et al., 2017; West et al., 2017). A further impact of positive embodiment is to address faulty cognitions, avoidance and re-experiencing through mindfulness practices and intentional thinking (Rocha et al., 2012). Interoception, the "felt sense" that is disrupted through trauma, is enhanced through the slow, deliberate movements, and mindful breath practices used in yoga (Khalsa et al., 2009) and is of great benefit with dissociated physical states. The cultivation of peripheral awareness together with focused attention that is necessary in the practice of mindfulness (Yates, Immergut & Graves, 2017) addresses the disrupted cognitive processes underlying the re-experiencing and avoidance trauma clusters (Cook-Cottone et al., 2017) by allowing the practitioner a greater awareness of the thought processes, allowing disidentification, examination and regulation. Hyperarousal is addressed through the impact of yoga practices on the autonomic nervous system, regulating the stress response and improving vagal tone (Blechert et al., 2008; Cohen et al., 2000; Grabbe & Miller-Karas, 2017; Khalsa et al., 2009; Steinwand, 2017; Yasuma & Hayano, 2004) creating states of greater resilience. Symptoms of re-experiencing, hyperarousal and avoidance were greatly reduced on the PCL-C checklist after the yoga and meditation program for all participants.

Breath, sound, and movement in the treatment of trauma

The physical components of the yoga and meditation program were beneficial for processing trauma symptoms for all participants in the study. The changes that occur in the brain due to traumatic experiences stop people from connecting with their bodies, affecting interoception, which is a vital part of resilience to trauma (Steinwand, 2017). Researchers have found that yoga, and in particular deep breathing, the kind that naturally accompanies chanting and singing and is contained in the formalized yoga breathing practices, restores the individual's ability to connect with their body (Emerson, 2015; Steinwand, 2017). The connection between vocal sound and human emotions (Dempsey, 2000; Garfield, 1987; Newberg & d'Aquili, 2000) and the fact that most human emotions are experienced within the body, and not only as cognitive phenomenology (Levine & Mate, 2010), was of interest in this study for the impact that sound, breath and movement had on all participants. The somatic aspect of trauma, an aspect that is echoed in the research of van der Kolk, Ogden, Siegel, Porges, Levine, and other authors interested in how trauma impacts the body, is revealed through the experiences of the study participants. Many research studies have explored the associations between emotional disorders, autonomic nervous system response and vagal tone (such as heart rate variability), and the negative impact that trauma and chronic stress have on the structures of brain and body; these psychophysiological states have been shown through many evidence based studies to be directly and positively impacted in the practice of mindful yoga and meditation (Cook-Cottone et al., 2017; Van der Kolk, 1994; West et al., 2017).

The practice of yoga provides stability and resourcing, giving people the capacity to be present and calm in the face of any emotions that may arise that are connected to their experience of trauma (Brown & Gerbarg, 2005; Jindani et al., 2015; Price et al., 2017; Steinwand, 2017; Telles et al., 2010; van der Kolk et al., 2014; West et al., 2017). The use of the voice, with the necessary and resultant control of the breath, to restore balance in the body, mind, emotions, and spirit, is central to the techniques used in this study. Study participants named the use of the chanting, across all data sets, as a particularly powerful yoga tool for bringing themselves back into balance, despite discomfort with the use of a foreign language and the unfamiliarity of the practice. Breath practices, and mind-engaging physical movements used in the dynamic yoga postures were also identified as regulating tools for continued use.

The emotional and cognitive development shown by the study participants during the eight-week yoga and meditation program testifies to findings in other studies that yoga and meditation are resourcing when used to treat trauma. This is reflected particularly in

participants' capacity to maintain gains they made well beyond the duration of the program, and in their capacity to use techniques learned during birthing and beyond, successfully protecting themselves from possible further traumatisation.

Chapter Six: Conclusion

6.1 Conclusion

All the participants in this study experienced a reduction in the self-reported PTSD symptoms during the yoga and meditation program. This reduction persisted beyond the eight-week program and was still evident eight weeks to six months postnatal, depending on when the final interview took place. PCL-C checklists were completed at two different times during the study, one before the start of the yoga and meditation program and the second at thirty-six weeks of pregnancy. All participants showed an improved PCL-C profile at thirty-six weeks.

Participants reported feeling empowered through the knowledge that they had tools to use when they felt signs of their symptoms emerging in stressful life circumstances. The yoga and meditation tools that were mentioned by all participants were chanting, breath work, and the physical aspect of movement and rhythm in the yoga kriyas, as being particularly noticeable in their impact on symptoms. Most participants also mentioned being less reactive to stress due to being able to interrogate their habitual thought patterns and adopt a new way of thinking which allowed them to feel more resilient. All participants mentioned feeling calmer and more present in their bodies and to themselves. This resulted in an increased self-esteem and the capacity to make changes in their lives such as erecting boundaries in abusive relationships and taking more care of themselves emotionally.

All participants mentioned changes in their relationships due to having an increased sense of self-control. Relationships mentioned included spousal, friend, family, and relationships with existing children. Also mentioned was the shift in the way they related to themselves. Most participants mentioned beneficial changes in the way they related to their lineages through the lineage practices included in the yoga and meditation program. For some participants who had rejected their lineages this was transformational and resulted in shifting how they related to living family members. For Black participants, the familiarity of the practice of including ancestors in a spiritual practice enabled a deeper trust in the process they were engaged in.

Participants experienced difficulties with different aspects of the yoga and meditation program; they struggled with the physical and mental components, particularly those who did not have much prior experience of yoga and meditation, and all experienced an improvement during the eight-week program of those aspects with which they were most challenged. Journaling and daily home practice was challenging for all participants, particularly those

who had full time employment, and some participants never really managed to either journal or do consistent daily practices.

All participants experienced a resurfacing of their symptoms in third trimester and they found the use of the tools they had learned during the yoga and meditation program, particularly breath work, to be especially useful once again to assist them in controlling the effects of their symptoms. All participants used what they had learned to assist them during birth and were able to stay calm and present even during caesarean sections, for those who had this procedure. For participants who had experienced previous traumatic births, their experience of birth was profoundly different, and they attributed this to the use of the tools they learned during therapy.

6.2 Limitations

The sample size of seven pregnant women was determined to be sufficient for the purposes of this research. The sample was chosen through a purposive, non-probability method which allowed for an in-depth exploration of the experiences of the participants in the study. The study took place in one geographical area, with participants only in the Gauteng region; future studies may consider participants from different regions in South Africa.

The use of yoga and meditation, as an indigenous knowledge system, needs more research to establish its usefulness in the treatment of trauma. The inclusion of sound, rhythm, and movement in the treatment of trauma, in the context of a spiritual relationship with the self, lineage, and community, provides a contrast to conventional treatments and concepts of trauma originating in the global North, and this may be effective for use in an African context.

Regarding bias, the researcher worked alone to both gather and analyse the data. Collaboration with other researchers and a process of triangulation with several researchers collecting and analysing the data would have prevented unavoidable bias that occurs when there is only one researcher's point of view guiding the selection of relevant literature and generating specific themes from the data. Although every effort was made to construct an interview schedule that was free from bias and allowed for a participant-led process, the fact that it was designed from the point of view of one researcher may have precluded an absence of bias. A reflexive process guided each step of the data collection and analysis, however the researcher's many years of experience in the field meant that an inherent subjectivity may have been unavoidable.

An additional limitation which could affect the purposive sampling of future studies of this nature was the use of the PCL-C checklist. Some PCL-C checklist items may not reflect certain conditions related to the normal condition of pregnancy when there are no PTSD symptoms, such as disturbed sleep and some confusion due to "pregnancy brain". A different instrument which more accurately takes these conditions into account in the measurement of PTSD symptoms would need to be sourced. Despite a thorough search of the literature, the researcher could not source such an instrument.

6.3 Implications and Recommendations for Future Research

The intersection of pregnancy with PTSD and yoga and meditation is a new field of research and this study could not do justice to all the aspects that arose out of the research. The medical aspect of the study, with the psychophysiological impact of the intersection of PTSD and yoga and meditation, could be a promising area of research if combined with a study focusing on the impact of maternal PTSD on infant neurodevelopment, such as that conducted by Koen et al (2017) at the University of Cape Town. This would allow for the measurement of specific brain structures impacted by PTSD and how the introduction of yoga and meditation could influence these. The larger sample sizes, quantitative information, and triangulation processes undertaken together with other researchers would greatly enhance the field of knowledge of yoga and meditation and maternal PTSD.

A further important area of research that is indicated in the literature, and from this study, regarding maternal PTSD, is the importance of gaining accurate quantitative and qualitative information on perinatal PTSD, and the impact that it has on *foetal* neurodevelopment. Combining this with yoga and meditation, it could be important to know whether the impact on brain structures, noted in the use of yoga and meditation with PTSD in adults, is applicable to foetal brain structures, and how this influences low birth weight, intrauterine growth restriction, and premature delivery outcomes seen with maternal PTSD. A further area of interest would be to explore the effects of attachment disorders in infants, children and adolescents seen with maternal PTSD, and whether these are influenced using yoga and meditation during pregnancy.

The introduction of culturally familiar aspects to the treatment of trauma in Africa needs more research. Exploring non-Western, decolonised methods and approaches to treatment methods for trauma is a deplorably under-researched area. Given the threatening social and economic grounds in which most African women live, and the high prevalence of lifetime

exposure to trauma, researching the effects of using treatment methods that include community based approaches with ancestors, dead relatives and family aspects included to allow for a decolonised approach to healing, would bring to light many aspects of healing trauma that could be useful for Western knowledge systems. Using voice, rhythm, sound, visualisation, and movement, all the foci of marginalised studies exploring their impact on health and healing, have been virtually ignored in the mainstream treatment of trauma. Yet these are commonplace methods of treating any kind of disease or discomfort in African, and other traditional cultures. The re-introduction of indigenous knowledge systems into healing modalities is slowly being recognised by structures such as the World Health Organisation (2015b, November 20), and in South Africa, by the National Research Foundation (NRF, 2019). Noticeable progress in the direction of successfully funded treatment initiatives using indigenous knowledge is slow with many difficulties arising to do with decolonising methodology and ownership of knowledge, and indigenous communities consistently left out of the equation (Kaya & Seleti, 2013; Keane, Khupe & Seehawer, 2017; Rao, 2006). Pharmaceutical interests, western colonisation and ownership, and mismatches between academic rules and indigenous knowledge system capture are some areas the research covers. Future large and well financed medical studies that include components of indigenous knowledge systems for experimental testing would be ground-breaking.

In conclusion, yoga and meditation are beneficial in the treatment of the PTSD symptom clusters of avoidance/numbing, hyperarousal, and re-experiencing. The use of sound, breath, mindfulness, and movement increase interoception and enhance cognitive capacity for reversing certain symptomatic thought patterns inherent in trauma. Yoga and meditation increase a sense of general wellbeing which facilitates relationships and can result in access to more supportive social networks. Used in pregnancy where there is presence of trauma, yoga and meditation may influence the formation of healthy attachment bonds between the mother and infant. The use of yoga and meditation within African contexts may facilitate the bridging of Western psychology's treatment of trauma with African indigenous knowledge systems of healing.

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Appendix

Appendix A

Participant Information Sheet

Good Day,

My name is Itta Roussos, I am a psychology student at the University of the Witwatersrand, currently conducting research as a requirement for obtaining my master's degree.

My study aims to explore the experiential accounts of women with self-reported symptoms of PTSD, in their second trimester of pregnancy, who do eight weeks of yoga and meditation.

I am inviting you to participate in my study following the indication of interest you signalled through social media or Whatsapp, following the advertisement of my study on such. You can indicate your intention to participate by signing the participant information sheet (Appendix B). Your participation is entirely voluntary, and you may refuse to continue at any stage of the study without any negative repercussions. There will be an initial interview, and screening for symptoms of PTSD by filling in a checklist for PTSD. Should your PTSD scoring fall within the inclusion criteria for the study – which will be fully explained to you at the initial interview and screening – you will then be invited to attend 8 free weekly sessions of yoga and meditation, of an hour and a half each, taught by a trained pregnancy yoga teacher. The time and place of the sessions will be communicated within 2 weeks of you signing the necessary documents. Should you not meet the inclusion criteria for this study, you may go for counselling at a nominal fee to the Emthonjeni Centre at the University of the Witwatersrand, or for no cost to the Bertrams Centre for Counselling (numbers are at the end of this information sheet).

During the yoga and meditation sessions, I may be at the back of the room taking case notes based on my observations, and immediately following the sessions I will receive the trainer's feedback; all observations will be used as part of the data set for the study. Throughout the 8 sessions you will be invited to journal your perceptions and experiences, on an entirely voluntary basis, both during sessions and between them. You will also be invited to continue journaling, as an optional process, throughout the remaining period of your pregnancy and through the birthing experience. Your journaling may, at your discretion, become part of the data for the study, to be seen only by myself. Following your participation in the 8 weekly sessions, there will be a second interview, of approximately 60 minutes, a third interview of

the same duration at week 36 of your pregnancy, or as close as possible to that time, and a fourth interview of equal duration 6-8 weeks post-delivery, or at a time that you determine to be suitable for you. All interviews will be at your home or an alternative venue convenient to you. The interviews will be recorded and transcribed upon you signing the participant consent form (Appendix C).

Please note that you may refuse to participate without any penalty, withdraw from the study at any stage, stop the interviews at any point should you feel uncomfortable, and withdraw your recorded and transcribed material from the study at any point before my report is submitted for examination. You may also refuse to answer any questions asked in the interviews. There are no benefits attached to participating in this research, other than any benefits that may accrue due to attending 8 free weekly yoga and meditation sessions, nor are there any penalties for refusing to participate. Should you feel any discomfort as a result of taking part in this study, counselling at a fee that will be determined according to your income (but no more than R20) will be available from the Emthonjeni Centre at the University of the Witwatersrand, or at no cost through Bertrams Centre for Counselling. The name and number of the relevant contact person at Emthonjeni is included below. While a specific counsellor cannot be named as the counsellors are volunteers with changing availability, the contact person will ensure that you are assigned to an available counsellor. The name and number of the counsellor at Bertram Centre for Counselling is included below.

Steps will be taken to ensure your anonymity, by removing information that could lead to personal identification and using a substitute name in the write up, and your confidentiality is guaranteed. Demographic information will be changed or excluded, place of work and/or residence will also be removed during the process of transcription should it and any other identifying information surface. Pseudonyms will be used in the final report to refer to any members of your family, friends, or work colleagues that you may mention in the interview.

Transcripts will only be read by me, as the primary researcher, and by my supervisor, Dr Renate Gericke, but your identity will also be protected from her. If a participant requests that only I have access to her transcripts, this will be respected. The digital records of the interviews will be kept in my password protected laptop. The recorded interviews, journaling (should it be made available) and session case notes will only be accessed by me and I will transcribe the recordings. The transcripts and recordings will be locked away in a filing

cabinet. Additionally, you can choose to withdraw your recorded and transcribed material at any point before the dissertation is submitted for examination.

The results from the interview, sessions, journaling and case notes will be written up in my dissertation which is a requirement for the completion of the master's degree. Once this dissertation has been published you can access it through the library catalogue of journals on www.wits.ac.za/library. Alternatively, you can request a copy of the dissertation findings from me via email, and a summary will be made available to you.

If you have any questions about the project, please feel free to contact me or my supervisor, Dr Renate Gericke on the email addresses or telephone numbers provided below.

Regards,

Itta Roussos (Researcher)

Tel: 0824416745

Email: ittaroussos@vodamail.co.za

Dr Renate Gericke (Research Supervisor and Clinical psychologist)

Tel: 01 717 4555

Email: renate.gericke@wits.ac.za

Emthonjeni Centre (Wits)

Contact person: Pabalo Lepota 011 717 4513

Bertrams Centre for Counseling

Counselor: Joanna Kistner 011 614 5242

Appendix B

Consent to Participate

I, _____, have read the participant information sheet (Appendix A) and consent to participating in the study aimed at exploring the experiential accounts of women with self-reported symptoms of PTSD, in their second trimester of pregnancy, who do an eight week program of yoga and meditation.

In so doing, I understand that:

- My participation in the study is voluntary.
- I understand that I will be interviewed prior to beginning the study and screened for symptoms of PTSD using the PCL_C checklist.
- I understand that I will take part in 8 weekly yoga and meditation sessions.
- I understand that I will be invited to journal my perceptions and experiences during and between sessions and that this is an entirely voluntary process.
- I understand that I will be invited to continue the journaling process throughout the rest of my pregnancy and through my birth experience and that this is also an entirely voluntary process.
- I understand that I will be invited to share my journaling with the researcher and that this is entirely optional.
- I understand that the primary researcher will sit in on some yoga and meditation sessions and make notes on her observations.
- I may withdraw from the study at any time by instructing the researcher to withdraw all my elicited material.
- I understand that I will be interviewed again immediately after the sessions have been completed.
- I understand that I will be interviewed again in week 36 or as close as possible to that time of my pregnancy.
- I understand that I will be interviewed again 6-8 weeks post-delivery, or at a time that is suitable for me as close as possible to this time.
- I understand that the interviews will be recorded and transcribed.
- I may refuse to answer any specific question/s.

- I understand that direct quotations from the interview may be used during the write-up of the report.
- Steps will be taken to ensure third party anonymity.
- Steps will be taken to ensure confidentiality, which is guaranteed.
- Steps will be taken to ensure confidentiality and anonymity of my family, friends, and work colleagues whose names may enter the interview.
- Transcripts will only be read by the primary researcher and her supervisor, Dr Renate Gericke, but my identity will also be protected from her. I may request that only the researcher has access to my transcript, and this will be respected.
- I understand that the dissertation write-up of this study may also be published.
- I understand that there are no specific benefits attached to participating in this research, although I will have access to the yoga and meditation sessions, nor are there any penalties for refusing to participate.
- There are also no perceived risks in participating, however I am aware of the counselling services which have been recommended should I experience any distress as a result of participating.
- I can request a summary of the findings of this study, once completed, from the researcher.

Signed: _____

Date: _____

Appendix C

Consent for four interviews to be recorded and transcribed

I, _____, after having read the participant information sheet give consent for my interviews to be recorded and transcribed. I understand that should I so decide, the recordings of the interviews can be deleted after they have been transcribed. The transcriptions and recordings will be kept safe and secure for 5 years after which period there is the option for them to be destroyed. Steps will be taken to protect my identity, by the use of pseudonyms and limiting access to the transcripts from the interviews to the primary researcher and her supervisor, Renate Gericke, or if I make the request, to only the primary researcher.

Signed:_____

Date: _____

Appendix D

Interview Schedule

This study explored the experiential accounts of seven women with self-reported symptoms of PTSD, in their second trimester of pregnancy, who did an eight week yoga and meditation program.

There are four sets of interviews, namely Interview A, which occurred before participation in the yoga and meditation program; interview B, which occurred immediately after participation in the program; interview C, which occurred at between 36 and 38 weeks of pregnancy; and interview D which occurred at between eight and twenty-four weeks post-delivery.

Interview A questions:

1. Demographic question:
   1.1 Age
   1.2 Marital status
   1.3 Employment status (employed (self or other)/ at home)
   1.4 Previous experience of pregnancy and birth if this isn't the first
   1.5 Any previous experience of yoga before the 8 yoga and meditation sessions.
2. How would you describe your general state of emotion currently?
3. What is it like to be pregnant now?
4. How would you describe your experience when you discovered that you had conceived?
5. How would you describe your current circumstances with regards to being pregnant?
6. What made you volunteer for this program?

Questions for Interview B and C and D were informed by:

- the observations of the researcher gathered during the 8 yoga and meditation sessions from recordings of the sessions
- instructor feedback from each session
- the participant's journal (if this was available)

Interview B questions:

1. How would you describe the impact on your pregnancy (if there is any) of the symptoms that you identified in the checklist before your participation in the program?
2. What was it like to participate in the yoga and meditation program?
3. What do you perceive about the impact of the yoga and meditation program (if there is any) on your experience of being pregnant?
4. What was your experience of the specific contributions (if there were any) of the yoga program to your experience of the symptoms identified in the first interview, and how they impacted on your experience of pregnancy?
5. How would you describe the difference (if there was any) between how you felt before the yoga program and afterwards with reference to feelings and sensations in your body, for example differences in your breathing, heart rate, balance, body temperature, any emotions, or any other particular sensations?
6. How would you describe the difference (if there was any) between how you felt before the yoga program and afterwards with reference to feeling highly alert, jumpy, irritable and/or angry, having difficulty concentrating and trouble with sleeping patterns, or any of the symptoms you identified in your first interview?
7. How would you describe the difference (if there was any) between how you felt before the yoga program and afterwards with reference to your relationships with other people and your relationship with yourself?
8. How would you describe the difference (if any) between how you felt before the program to now with reference to feelings about the meaning of your life and your sense of purpose?
9. How would you describe the difference (if any) between how you felt before the program to now with reference to how you think and feel about your future?

Interview C:

1. How would you describe your general state of emotion now that you are in week 36?
2. How would you describe your experience of the period between completing the yoga and meditation program and now?
3. How would you describe the impact on your experience of your last months of pregnancy (if there is any) of the symptoms that you identified before your participation in the program?

4. What is your experience of the specific contributions (if there are any) of the yoga and meditation program on your experience of these symptoms, in the period between completing the program and now?
5. How would you describe the difference (if there is any) between your experience of your bodily sensations, your thoughts, emotions and relationships, especially with regard to the symptoms that you identified before the program began, between the end of the yoga and meditation program and now?
6. How would you describe the impact of the yoga and meditation program (if there is any) on your general experience of these last few months of your pregnancy?

Interview D questions:

1. How would you describe your general state of emotion now that your baby is born?
2. How would you describe your experience of the birth of your baby?
3. What do you perceive about the impact of the yoga and meditation program (if there was any) on your experience of the symptoms that you identified in the first interview, during your birthing experience?
4. How would you describe the general impact of the yoga and meditation program (if there was any) on your experience of the birth of your baby?
5. How would you describe any specific contributions (if there are any) which the yoga and meditation program made to your experience of the birth of your baby?
6. How would you describe your experience of the circumstances that led to the development of the symptoms you described at the first interview?
7. How would you describe your experience of how the yoga program has impacted, if at all, on your experience of these circumstances?
8. How would you describe the differences as a result of doing the yoga program, if there are any, in your bodily sensations, emotional reactions, your thoughts and feelings about yourself and others, particularly as you identified in your first interview, when you describe your experience of the circumstances the led to the development of these symptoms?

Appendix E

PTSD Checklist – Civilian Version (PCL-C)

Administered before the yoga and meditation program and again at the time of the third interview.

Client's Name: _____

Instruction to patient: Below is a list of problems and complaints that veterans sometimes have in response to stressful life experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem *in the last month*.

No.	**Response**	**Not at all (1)**	**A little bit (2)**	**Moderately (3)**	**Quite a bit (4)**	**Extremely (5)**
1.	Repeated, disturbing *memories, thoughts, or images* of a stressful experience from the past?					
2.	Repeated, disturbing *dreams* of a stressful experience from the past?					
3.	Suddenly *acting* or *feeling* as if a stressful experience *were happening* again (as if you were reliving it)?					
4.	Feeling *very upset* when *something reminded* you of a stressful experience from the past?					
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, or					

	sweating) when *something reminded* you of a stressful experience from the past?					
6.	Avoid *thinking about* or *talking about* a stressful experience from the past or avoid *having feelings* related to it?					
7.	Avoid *activities* or *situations* because they *remind* *you* of a stressful experience from the past?					
8.	Trouble *remembering important parts* of a stressful experience from the past?					
9.	Loss of *interest in things that you used to enjoy?*					
10.	Feeling *distant* or *cut* off from other people?					
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12.	Feeling as if your *future* will somehow be *cut short*?					
13.	Trouble *falling* or *staying asleep*?					
14.	Feeling *irritable* or having *angry outbursts*?					
15.	Having *difficulty concentrating*?					
16.	Being *"super alert"* or watchful on guard?					
17.	Feeling *jumpy* or easily startled?					

PCL-M for DSM-IV (11/1/94) Weathers, Litz, Huska, & Keane National Center for PTSD - Behavioral Science Division This is a Government document in the public domain.

The PCL is a standardized self-report rating scale for PTSD comprising 17 items that correspond to the key symptoms of PTSD. Two versions of the PCL exist: 1) PCL-M is

specific to PTSD caused by military experiences and 2) PCL-C is applied generally to any traumatic event.

The PCL can be easily modified to fit specific time frames or events. For example, instead of asking about "the past month," questions may ask about "the past week" or be modified to focus on events specific to a deployment.

How is the PCL completed?

- The PCL is self-administered
- Respondents indicate how much they have been bothered by a symptom over the past month using a 5-point (1-5) scale, circling their responses. Responses range from **1** *Not at all* – **5** *Extremely*

How is the PCL scored?

1. Add up all items for a total severity score

or

2. Treat response categories **3-5** (*Moderately* or above) as symptomatic and responses **1-2** (below *Moderately*) as non-symptomatic, then use the following DSM criteria for a diagnosis:
   - Symptomatic response to at least 1 "B" item (Questions 1-5),
   - Symptomatic response to at least 3 "C" items (Questions 6-12), and
   - Symptomatic response to at least 2 "D" items (Questions 13-17)

Are Results Valid and Reliable?

- Two studies of both Vietnam and Persian Gulf theater veterans show that the PCL is both valid and reliable (Additional references are available from the DHCC)

What Additional Follow-up is Available?

- All military health system beneficiaries with health concerns they believe are deployment-related are encouraged to seek medical care
- Patients should be asked, "**Is your health concern today related to a deployment?"** during all primary care visits.
- If the patient replies, "**yes**", the provider should follow the Post-Deployment

Health Clinical Practice Guideline (PDH-CPG) and supporting guidelines available through the DHCC and www.PDHealth.mil.

DHCC Clinicians Helpline: 1 (866) 559-1627 DSN: 662-6563 www.PDHealth.mil PDH-CPG Tool Kit Pocket Cards Version 1.0 December 2003

Appendix F

Yoga and meditation program instructor structured feedback form

1. Applying your centred and grounded observation techniques, what stood out for you during this session?
2. Staying in neutral mind, what went well for the participant during this session?
3. Without moving into judgement of yourself, what did not go well for you during this session?
4. What did not go well for the participant during this session, noting aspects of breathing, body posture, emotional responses, facial gestures, and other discomforts?
5. What did you notice about the participant's responses during the session that seemed to indicate a response coming from meditative mind/mindfulness?

Appendix G

Curriculum to transform symptoms of PTSD during pregnancy

Eight-week program.

Week One: Introduction to Kundalini Yoga (KY) to Transform symptoms of PTSD in pregnancy.

Key skills/Concepts:

- Mental illness as a condition of low prana, the role of prana to elevate mind
- Basic introductory skills to practice KY: how to sit; breathe, tune in and tune out
- Yoga during pregnancy: dos and don'ts

  Never any pressure on stomach

  Lying on back contraindicated

  Never use stomach muscles to sit up

  Cushions to pad the tummy when lying on the side for relaxation

  Never retain breath in or out

  No root lock, the only bhanda that can be practised is neck lock

  Repeated instructions every week
- Self-Awareness and Self-Reflection

Kriyas and Meditations:

- Alternate nostril breath: inhale left, exhale right 1-3 minutes
- Sitting relaxation 1-3 minutes
- Calmness and Anti-Anxiety Kriya ½ time
- Guided progressive muscle tension and relaxing, from feet to head 3-7 min lying on side
- Segmented breath for anxiety 5 mins

  Parasympathetic NS stimulation.
- Sitting relaxation 1-3 minutes

Self-Reflection for the Week:

Notice the different feeling generated by changing the breath and moving the body. Consciously practice and apply this to build prana to support a calm mind. Consciously practice and apply awareness of tension and relaxation.

Journal questions:

- When do I notice the feelings of tension in my body? What do they feel like physically (using words like warm/cold/tight/loose/sticky/expanded/constricted or any other words that describe the tension in a physical way).
- What are the thoughts that are present with the tension? If you can catch the thoughts please journal on them.

Suggested Home Practice:

- Segmented breath for anxiety 5 mins.
- Journal immediately after the meditation and record the feelings and emotions that you noticed while doing the kriya and meditation. Make comparisons daily with how it is different from other times of the day and how each day's practice is affecting you.

Week Two: Self-Regulation and Rhythmic Balance

Key skills/Concepts:

- Short introduction, not longer than 10 minutes talking
- Go over the basics from week 1
- Role of prana to elevate mind, calm agitation and slow the flow of thoughts
- Review dos and don'ts for pregnancy yoga
- Self-Awareness and Self-Reflection: how to increase the practice
- Self-Regulation through rhythmic movement benefits brain function and helps slow the flow of thoughts, calm agitation and raise vitality
- Develop rhythmic deep breathing – go over the basics remember to stretch UP
- Lineage visualisation and bowing to all lineages, blood and knowledge

Kriyas and Meditations:

- Alternate nostril breath: inhale left, exhale right 3-7 minutes
- Sitting relaxation 3 minutes

- Short lineage visualisation and bowing
- Repeat kriya from last week, full time
- Guided progressive muscle tension and relaxing, going up from the feet to the head, 7 minutes
- Practice segmented breath for anxiety 11 minutes
- Sitting relaxation 1-3 minutes and guide awareness to bodily sensations and/or emotions

Self-Reflection for the Week:

- Identify one thing you can do to calm agitation in the body, slow the flow of thoughts, and deepen your breath. Consciously practice that one thing OR
- Identify one thing you can do to raise vitality and consciously practice that one thing.
- Consciously practice and apply awareness of tension and relaxation.
- Journal on your reflections of the practice.
- Journal immediately after the meditation and record the feelings and emotions that you noticed while doing the kriya and meditation. Make comparisons daily with how it is different from other times of the day and how each day's practice is affecting you.

Suggested Home Practice:

- Segmented breath for anxiety 11 mins.
- Lineage visualisation
- Journal immediately after the meditation and record the feelings and emotions that you noticed while doing the kriya and meditation. Make comparisons daily with how it is different from other times of the day and how each day's practice is affecting you.

Week Three: Increasing Vitality, and Capacity to Slow the Flow of Thought, and Calming Agitation

Key skills/Concepts:

- Short introduction, not longer than 10 minutes talking
- Go over the basics from week 1

- Role of prana to elevate mind, calm agitation and slow the flow of thoughts
- Review dos and don'ts for pregnancy yoga
- Self-Awareness and Self-Reflection: how to increase the practice
- Self-Regulation through rhythmic movement benefits brain function and helps slow the flow of thoughts, calm agitation and raise vitality
- Develop rhythmic deep breathing – go over the basics remember to stretch UP
- Lineage practices

Kriyas and Meditations:

- Breath Series to Balance the Blood and Mental Attitude ½ time https://www.3ho.org/kundalini-yoga/pranayam/breath-cleansing-pranayam For the third pranayama change from breath of fire to long deep breathing.
- Sitting Relaxation 1-3 minutes
- Lineage visualisation and bowing
- Tattwas, Pranic Rib Cage and Nervous System ½ time (adjusted for pregnancy: the last exercise is done sitting straight up with long deep breathing) http://kundaliniyogasoundhealing.com/wp-content/uploads/2017/01/Kriya-for-Tattvas-Pranic-Rib-Cage-and-Nervous-System.pdf
- Guided Deep Relaxation 3-7 minutes
- Anti-anxiety meditation 5 minutes
- https://goldenlinkyoga.com/2013/05/20/anti-anxiety-meditation/ write the words down to look at and use for home practice.
- Sit and reflect on feelings and sensations 3 minutes

Self-Reflection for the Week: write these questions down and journal on these questions specifically. If participant struggles with what to write in her journal and experiences resistance, explain resistance/boredom is a feeling and can be included these in awareness.

- What thoughts, feelings or sensations do you notice when your mind is generating repeated thoughts and when it is still and quieter?
- What thoughts, feelings or sensations do you notice when your body is tense and agitated, i.e. when you are experiencing the PTSD symptoms you have reported?
- What do you notice internally when you do the lineage practices?

- Write these observations down. Make a conscious decision to both elevate and slow the flow of thought, and calm the agitation in your body by using breath and/or mantra
- Consciously practice this several times this week.

Suggested Home Practice:

- Anti-anxiety meditation 5 minutes

Week Four: Supportive Habits

Key skills/Concepts:

- Short introduction, not longer than 10 minutes going over basics of breathing and do's and don'ts for pregnancy yoga
- Vitality and Calm: the state of a yogi vs Hyperarousal, elevated heart rate and PTSD

  Yogis have calm vitality, energised state without being wired. Hyperarousal feels productive but it's a waste of energy
- The role of Prana in quality and flow of thought and calming agitation.
- The cycle of thought – thought gets cloaked with feeling and emotion based on previous experiences, becomes a desire and an action, leading to a kharma based reaction. Contrast with Dharmic path of awareness.
- The Role of Awareness and Choice – choice is impossible without awareness of what is going on in the body, understanding how to name and distance oneself from what is going on to observe it
- Building skill in shifting thought and feeling – emphasise how awareness is the beginning of choice – during the kriya, identify how feelings are connected to thoughts
- Use of Mantra to support the flow and quality of thoughts, calm agitation and raise energy levels – during the chanting section
- Supportive Habits, doing what uplifts your energy and quality of thought, calms agitation and slows the flow of thought – introducing this concept as part of the kriya not in the intro otherwise too much in the beginning
- 120th day lineage practice

Kriyas and Meditations:

- Breath Series to Balance the Blood and Mental Attitude full time https://www.3ho.org/kundalini-yoga/pranayam/breath-cleansing-pranayam For the third pranayam change from breath of fire to long deep breathing.
- Sitting Relaxation 3 minutes
- Preparing to welcome the soul of the baby lineage practice
- Tattwas, Pranic Rib Cage and Nervous System 1/2 time (adjusted for pregnancy: the last exercise is done sitting straight up with long deep breathing) http://kundaliniyogasoundhealing.com/wp-content/uploads/2017/01/Kriya-for-Tattvas-Pranic-Rib-Cage-and-Nervous-System.pdf
- Guided Deep Relaxation 7 minutes
- Anti-anxiety meditation 11 minutes https://goldenlinkyoga.com/2013/05/20/anti-anxiety-meditation/
- Sit and reflect on feelings and sensations 3 minutes

Self-Reflection for the Week:

- Notice times when your nervous system is aroused and you feel charged. What thoughts or beliefs and behaviours are connected to these feelings? Write these down.
- Notice when you experience your authentic self with vitality and calm. What thoughts, beliefs and behaviours are connected with these feelings? Write these down.
- Make a decision to notice your sensations then take steps to uplift your energy and quality of thoughts and actions by using breath and/or mantra.
- Consciously practice and apply slowing and deepening the breath and notice the effect on how you feel. Notice how monitoring thoughts and sensations affects how you feel.
- Notice the effect of being amongst others (at work, at home) and how this impacts on your experience of your bodily sensations and thoughts.
- Notice the effect of your 120th day lineage practice.
- Journal.

Suggested Home Practice:

- Sitali Breath 3-7 minutes

Week Five: Meeting the Challenge of Maintaining Supportive Habits

Key skills/Concepts:

- You shape your habits then habits shape you
- Maintaining vitality and calm through supportive habits
- Reiterate the cycle of thought, track embodied feelings connected with the thoughts
- Awareness of the thoughts and feelings: how they connect to behaviour brings choice of which behaviours to allow
- How supportive habits can replace destructive habits as part of choosing behaviours
- Use of Mantra to support calm and relaxed body and generate supportive thoughts

Kriyas and Meditations:

- Pranayam – achieve an experience of god – 3 mins http://www.gurudevsnr.com/uploads/2013/01/KYB117-860822-AchieveAnExperienceOfGod.pdf
- Sitting Relaxation 3 minutes
- Locating your place in your lineage, permission and blessing
- Wahe Guru Kriya for pregnancy full times
- Guided Deep Relaxation 7 minutes
- I am thine in mine myself 7 minutes (use Livtar Singh version) http://www.shaktakaur.com/meditations/to_bring_home_the_purpose_of_life.htm
- Sitting relaxation 1-3 minutes

Self-Reflection for the Week:

- Journal how you ensure your success with one new belief and one new habit
- Identify and journal how you manage a setback, barrier, or disappointment, and how you get support for your new habit.
- Continue the decision to maintain your new habit.
- What helps you keep your new beliefs and behaviours? What gets you off track? What brings you back? Write these down and write a solution to staying on track and getting back when you are off.
- What is the impact of asking your ancestors for permission to live your life free of lineage trauma?

- How do you get support for new behaviours and beliefs?

Suggested Home Practice:

- I am thine in mine myself 7 minutes

Week Six: Building Mastery.

Key skills/Concepts:

- Maintain new habits.
- Evaluate barriers to engaging in healthy and positive behaviours
- Identify practices and habits that can be used to overcome these barriers, including positive support.
- Engaging with Divine Mother energy as archetypal mother and support for healing the mother wound

Kriyas and Meditations:

- Pranayam – the whistling breath for vagal nerve – stimulates self-love and compassion
  Inhale with a high pitched whistle and exhale through the nose: focus on third eye – 3 mins
  Reverse (exhale with a whistle)
  Focus on 3rd eye and sound of whistle - 3 mins
- Sitting Relaxation 3 minutes
- Divine Mother visualisation and Deity work
- State of mind and paranoia pregnancy kriya ½ time
- Guided Deep Relaxation 7 minutes
- Happy am I breath
  https://www.3ho.org/articles/kundalini-yoga-healthy-happy-holy-breath
  Don't hold the breath at all. Do 3 repetitions of the mantra silently on the inhale (she will have to slow her breath down radically to fit this in) and on the exhale do as instructed and repeat aloud 5.5mins
- Meditation on the Divine Mother
  https://www.3ho.org/3ho-lifestyle/women/meditation-divine-mother-adi-shakti

There are four parts to this meditation. Do each part for 2.5 mins using whatever version of Adi Shakti you prefer and move straight into the sitting relaxation

- Sitting relaxation 1-3 minutes

Self-Reflection for the Week:

- Continue to journal around your new belief and habit. Identify what it is about the belief and habit that is inspiring to you, and how it will ensure your success
- Journal how you are getting support for your new habit.
- Write down when you feel effective in holding your new belief and/or habit and what circumstances challenge it.
- What is the effect of tuning into Divine Mother energy?
- Journal on the impact you feel in your body.
- Write down what steps you can take when you feel challenged in the self-regulation of your new thoughts and feelings.

Suggested Home Practice:

- Meditation on the Divine Mother 11 minutes

Week Seven: The Authentic Self: Living in Radiance and Spirit.

Key skills/Concepts:

- Free your energy to live as the Authentic Self – engage in a discussion around what is the Authentic (Original) Self as opposed to the wounded self, or the ego.
- Increased awareness of baseline prana – what is the impact of pranayama on top of the baseline – increasing awareness of this.
- Integration of Change
- Living in Radiance and Spirit
- Engaging with Divine Mother - the concept of Shakti Goddess (Adi Shakti, Serab Shakti, Pritam Bhagawati, Kundalini Mata Shakti – the 4 faces of Shakti Goddess.

Kriyas and Meditations:

- Pranayaam: the whistling breath for vagal nerve – stimulates self-love and compassion. 3 mins
- Sitting Relaxation 3 minutes

- Kriya to Balance the Brain 1/3 time

  Exercise 5: If arms can't reach together behind then put them on shoulders

  Exercise 9: done very carefully and slowly; lean back on hands and tap heels as close to butt as possible

  Exercise 10: legs straight out in front angled to the side around the baby, hands on knees and bending forward over the straight leg bringing heart to leg and feeling stretch in lower back and leg

  Exercise 11: keep hands in prayer pose over the head with elbows as straight as possible; long deep breathing. Long Deep Breathing stretching up as tall as possible for 3 mins.
- Guided Deep Relaxation 7-11 minutes
- Seated breath awareness 3 mins

  https://www.3ho.org/kundalini-yoga/pranayam/pranayam-techniques/breath-awareness-exercise

  This week and next the practice of awareness of baseline of prana and learning to notice when that is different i.e. what is happening with the emotions and how is this indicated in the pranic shifts
- Meditation on Shakti

  Adi Shakti with Celestial Communication 11 minutes
- Sitting relaxation 1-3 minutes

Self-Reflection for the Week:

- Identify the times that you have noticed yourself being able to live with more access to vitality and calm; write down whatever you have noticed about those times: what situations they happen in, whether you notice anything about your level of energy, your breathing, your thoughts, your emotions. Journal around this with as much detail as possible.
- Identify and journal what you notice about your breathing during those times when you do not have access to vitality and calm. When your energy levels become erratic and you are not able to stay with the calm and spacious feeling you identified above. If you are able to identify the thoughts and emotions that come to you during these times note them down in your journal.
- Identify and journal what the process of identification and journaling is like.

- Journal around what it is like to live as the authentic self, versus the wounded or ego state of self.
- Identify and journal what contributes to your continued progress.
- Journal on the impact of the Divine Mother energy.
- Identify those yogic practices you will continue after the course is over and how to get the support you may need

Suggested Home Practice:

- Adi Shakti 11 minutes

Week Eight: The Authentic Self: Living in Radiance and Spirit.

Key skills/Concepts:

- Authentic Self as unbroken and whole versus the wounds and dis-identification from wounded self without denial or rejection
- Continuing to increase awareness of baseline of pranic energy and what builds this up and breaks it down
- Integration of Change
- Continued increased awareness of what stops the integration of change
- Understanding the difference between your Radiance and what dims that
- Continued relationship with Shakti

Kriyas and Meditations:

- Pranayaam – a pure flame of light (see warning below)
- Sitting Relaxation 3 minutes
- Kriya for frontal lobe ½ time (dancing section no longer than 11 minutes according to capacity) https://www.pinklotus.org/KY%20KRI/KRI%20KY%20kriyas/Kriya%20for%20The%20Frontal%20Brain.pdf
- Guided Deep Relaxation 7-11 minutes
- Guru Gaitri Meditation for negative mind 11 minutes
- Seated breath awareness 3 mins https://www.3ho.org/kundalini-yoga/pranayam/pranayam-techniques/breath-awareness-exercise

Continue to practice awareness of baseline prana and notice what is happening with emotions and how is this indicated in the pranic shifts.

A Pure Flame of Light

WARNING: WHEN YOGI BHAJAN TAUGHT THIS MEDITATION HE SAID IT SHOULD NEVER BE PRACTISED ALONE, ONLY WITH AN EXPERIENCED TEACHER. ANY OTHER OF THE PRANAYAAMS IN THE 8 WEEK SERIES CAN BE PRACTISED AT HOME ALONE BARRING THIS ONE.

Guru Gaitree Mantra Meditation

Sit straight in Easy Pose.

MUDRA: Hands on knees in Gyan Mudra.

EYES: Focus at the brow point.

MANTRA: Chant this mantra on one breath. It takes about 15 seconds:

Gobinday Sustains You

Mukanday Liberates You

Udaaray Elevates You

Apaaray Delivers You Across

Hareeang Destroys All

Kareeang Creates All

Nirnaamay Beyond Category and Name

Akaamay Beyond Desire

To chant it correctly, inhale deeply, and apply Mulbandh (no navel, only anus and genitals) as you begin to chant. Pull the base lock of genitals and anus a little tighter with each phrase, as with an elevator going up 10 floors, tightening progressively till can't pull anymore.

COMMENTS

This meditation works on subconscious blocks, especially around issues of fear. It works on the negative mind. When the Negative Mind is too strong, you may appear to be rigid,

reactive, and over-dominant. When balanced you deliver strong focused actions and you enjoy challenge. You act, but always with a cover and a back-up plan.

Self-Reflection for the Week:

- Celebrate your accomplishments and new skills
- Continue to build self-regulation skills through awareness and monitoring thoughts, movement and breath. Journal on how doing this affects how you feel.
- Notice in your journal what supports and contributes to your continued progress.
- Make a commitment to continue to use these supports and to build in a journaling practice that identifies how they are helping.
- Identify in your journal what the difference is when you stop doing the things that help your continued progress.
- Identify those yogic practices* you will continue after the course is over and how to get the support you may need (*barring the ones where home –alone practised in contra-indicated).
- Check through your journaling of the past 8 weeks and identify the shifts that you notice in your journaling, write these down and link them to shifts in your behaviour if possible.

Suggested Home Practice:

- Optionally continue to journal throughout your pregnancy monitoring your self-regulation skills with thoughts, movement and breath, noticing how this affects your state of mind and body.
- Continue with one of the yoga breathing practices that you enjoyed doing the most (*see note above on home-alone practices).

Guru Gaitri meditation 11 minutes. Continue with this meditation throughout your pregnancy or, if you prefer to do one of the others you have learntAppendix **H**

Appendix H

Guidelines for participant journaling

Week One: Introduction to Kundalini Yoga (KY) to Transform symptoms of PTSD in pregnancy

Self-Reflection for the Week:

Notice the different feeling generated by changing the breath and moving the body. Consciously practice and apply this to build prana to support a calm mind. Consciously practice and apply awareness of tension and relaxation.

Journal questions:

- When do I notice the feelings of tension in my body? What do they feel like physically (using words like warm/cold/tight/loose/sticky/expanded/constricted or any other words that describe the tension in a physical way).
- What are the thoughts that are present with the tension? If you can catch the thoughts please journal on them.

Week Two: Self-Regulation and Rhythmic Balance

Self-Reflection for the Week:

- Identify one thing you can do to calm agitation in the body, slow the flow of thoughts, and deepen your breath. Consciously practice that one thing OR
- Identify one thing you can do to raise vitality and consciously practice that one thing.
- Consciously practice and apply awareness of tension and relaxation.
- Journal on your reflections of the practice.
- Journal immediately after the meditation and record the feelings and emotions that you noticed while doing the kriya and meditation. Make comparisons daily with how it is different from other times of the day and how each day's practice is affecting you.

Week Three: Increasing Vitality, and Capacity to Slow the Flow of Thought, and Calming Agitation.

Self-Reflection for the Week: write these questions down and journal on these questions specifically. If participant struggles with what to write in her journal and experiences resistance, explain resistance/boredom is a feeling and can be included these in awareness.

- What thoughts, feelings or sensations do you notice when your mind is generating repeated thoughts and when it is still and quieter?
- What thoughts, feelings or sensations do you notice when your body is tense and agitated, i.e. when you are experiencing the PTSD symptoms you have reported?
- What do you notice internally when you do the lineage practices?
- Write these observations down. Make a conscious decision to both elevate and slow the flow of thought, and calm the agitation in your body by using breath and/or mantra
- Consciously practice this several times this week.

Week Four: Supportive Habits.

Self-Reflection for the Week:

- Notice times when your nervous system is aroused and you feel charged. What thoughts or beliefs and behaviours are connected to these feelings? Write these down.
- Notice when you experience your authentic self with vitality and calm. What thoughts, beliefs and behaviours are connected with these feelings? Write these down.
- Make a decision to notice your sensations then take steps to uplift your energy and quality of thoughts and actions by using breath and/or mantra.
- Consciously practice and apply slowing and deepening the breath and notice the effect on how you feel. Notice how monitoring thoughts and sensations affects how you feel.
- Notice the effect of being amongst others (at work, at home) and how this impacts on your experience of your bodily sensations and thoughts.
- Notice the effect of your 120th day lineage practice.
- Journal.

Week Five: Meeting the Challenge of Maintaining Supportive Habits.

Self-Reflection for the Week:

- Journal how you ensure your success with one new belief and one new habit
- Identify and journal how you manage a setback, barrier, or disappointment, and how you get support for your new habit.
- Continue the decision to maintain your new habit.
- What helps you keep your new beliefs and behaviours? What gets you off track? What brings you back? Write these down and write a solution to staying on track and getting back when you are off.
- What is the impact of asking your ancestors for permission to live your life free of lineage trauma?
- How do you get support for new behaviours and beliefs?
- and beliefs?
- Journal on your experiences.

Week Six: Building Mastery.

Self-Reflection for the Week:

- Continue to journal around your new belief and habit. Identify what it is about the belief and habit that is inspiring to you, and how it will ensure your success
- Journal how you are getting support for your new habit.
- Write down when you feel effective in holding your new belief and/or habit and what circumstances challenge it.
- What is the effect of tuning into Divine Mother energy?
- Journal on the impact you feel in your body.
- Write down what steps you can take when you feel challenged in the self-regulation of your new thoughts and feelings.

Week Seven: The Authentic Self: Living in Radiance and Spirit

Self-Reflection for the Week:

- Identify the times that you have noticed yourself being able to live with more access to vitality and calm; write down whatever you have noticed about those times: what situations they happen in, whether you notice anything about your level of energy, your breathing, your thoughts, your emotions. Journal around this with as much detail as possible.

- Identify and journal what you notice about your breathing during those times when you do not have access to vitality and calm. When your energy levels become erratic and you are not able to stay with the calm and spacious feeling you identified above. If you are able to identify the thoughts and emotions that come to you during these times note them down in your journal.
- Identify and journal what the process of identification and journaling is like.
- Journal around what it is like to live as the authentic self, versus the wounded or ego state of self.
- Identify and journal what contributes to your continued progress.
- Journal on the impact of the Divine Mother energy.
- Identify those yogic practices you will continue after the course is over and how to get the support you may need

Week Eight: The Authentic Self: Living in Radiance and Spirit

Self-Reflection for the Week:

- Celebrate your accomplishments and new skills
- Continue to build self-regulation skills through awareness and monitoring thoughts, movement and breath. Journal on how doing this affects how you feel.
- Notice in your journal what supports and contributes to your continued progress.
- Make a commitment to continue to use these supports and to build in a journaling practice that identifies how they are helping.
- Identify in your journal what the difference is when you stop doing the things that help your continued progress.
- Identify those yogic practices* you will continue after the course is over and how to get the support you may need (*barring the ones where home –alone practised in contra-indicated).
- Check through your journaling of the past 8 weeks and identify the shifts that you notice in your journaling, write these down and link them to shifts in your behaviour if possible.

End of program: A way forward

Suggested Home Practice:

- Optionally continue to journal throughout your pregnancy monitoring your self-regulation skills with thoughts, movement, and breath, noticing how this affects your state of mind and body.
- Continue with one of the yoga breathing practices that you enjoyed doing the most.

Appendix I

Procedure for assessing yoga and meditation program recordings

- Every yoga and meditation session was recorded, with permission from the participants, and the researcher had access to the recording immediately after the session.
- Each session was replayed as soon as possible afterwards, and the researcher made notes, comparing the recording to the feedback received from the instructor.
- At the end of the study, when analysing the data for the second interview, the researcher replayed the recordings again and compared observations with the notes taken previously and compared observations to see if anything new could be added.
- Researcher notes were cross-checked once again with instructor feedback to check for new information or insights and cross-checked with participant journaling at the time of the yoga and meditation program, to form a more complete picture of what the participant was experiencing.
- This material was used together with the interview material to generate themes at the time of the second interview.

Appendix J

PTSD yoga and meditation program media

https://www.dropbox.com/s/xf8az7llggz41f3/PTSD%20video%20%28with%20audio%29.mov?dl=0

Are you PREGNANT and suffer from PTSD.

ARE YOU PREGNANT AND SUFFER FROM PTSD?

Find out if you qualify for a research study on 8 weeks of FREE Yoga Therapy...

1.) Are you in, or close to, second trimester (12-28 weeks)?

2.) Do you experience:

1 of the following symptoms?

- Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?
- Repeated, disturbing dreams of a stressful experience from the past?
- Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?
- Feeling very upset when something reminded you of a stressful experience from the past?
- Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful experience from the past?

2 of the following symptoms?

- Trouble falling or staying asleep?
- Feeling irritable or having angry outbursts?
- Having difficulty concentrating?
- Being "super alert" or watchful on guard?
- Feeling jumpy or easily startled?

3 of the following symptoms?

- Avoid thinking about or talking about a stressful experience from the past or avoid having feelings related to it?
- Avoid activities or situations because they remind you of a stressful experience from the past?
- Trouble remembering important parts of a stressful experience from the past?
- Loss of interest in things that you used to enjoy?
- Feeling distant or cut off from other people?
- Feeling emotionally numb or being unable to have loving feelings for those close to you?
- Feeling as if your future will somehow be cut short?

If you answered "YES" and you would like to be part of a research study that includes an 8 week yoga therapy course specifically addressing Pregnancy and PTSD please contact:

Itta Roussos:
itta.roussos@gmail.com
www.ittaroussos.co.za

ITTA ROUSSOS
dynamic healing and growth

Appendix K

Ethics Clearance Certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Roussos

CLEARANCE CERTIFICATE	PROTOCOL NUMBER: H16/05/23
PROJECT TITLE	The experience of yoga therapy in pregnant women with PTSD symptoms
INVESTIGATOR(S)	Mrs M Roussos
SCHOOL/DEPARTMENT	Human and Community Development/
DATE CONSIDERED	20 May 2016
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	25 August 2019
DATE 26 August 2016	CHAIRPERSON (Professor J Knight)

cc: Supervisor : Ms R Gericke

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix L

African Kundalini Yoga (AKY) yoga and meditation program for pregnancy and PTSD

AKY yoga and meditation program is based on two programs developed by the Guru Ram Das Center for Medicine and Humanology. Both studies were used in peer reviewed studies on generalised anxiety disorder and PTSD (Khalsa, 2015; Jindani et al., 2015; Gabriel et al., 2018). The yoga and meditaiton program was customised for use with pregnancy by adjusting postures and breathing that are contraindicated or difficult to achieve in pregnancy.

Aspects of lineage practices used in yoga and meditation were included in the program such as visualisations of the participants' ancestors on both sides and creating a bowing ritual around practices that are used to honour the ancestors.

Divine Mother archetypes are common in Ayurvedic and yoga practices, which use deity energy to achieve states of consciousness beyond the reach of the mind. Meditations on Divine Mother energy were included in the practice to establish an internal connection with mothering beyond the human aspect.