OUTCOMES AND IMPACT OF AN ICU ADMISSION FOR SEVERE MATERNAL COMPLICATIONS DURING PREGNANCY OR BIRTH: A CASE STUDY.

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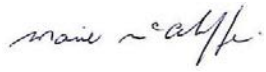

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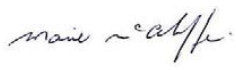

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Abstract

OUTCOMES AND IMPACT OF AN ICU ADMISSION FOR SEVERE MATERNAL COMPLICATIONS DURING PREGNANCY OR BIRTH: A CASE STUDY.

Pregnancy and childbirth is a sacred time in a woman's life, experienced as a normal physiological event for most women. Alterations to a woman's physiology during pregnancy means that an admission to an intensive care unit (ICU) during pregnancy or birth is likely to represent an episode of severe maternal morbidity.

An integrated literature review found that there was a paucity of literature relating to critically ill women requiring admission to the ICU for severe maternal complications during pregnancy or birth. The literature relating to these women was largely focused on the pathophysiological processes with maternal outcomes primarily described as morbidity and mortality rates.

The aim of this study was to explore the health and wellbeing of women who experienced an ICU admission for severe maternal complications during pregnancy or birth. Multiple methods were employed to collect qualitative and quantitative data from pregnant and postnatal women who had received care in the ICU of an Australian regional tertiary hospital. Case study methodology was applied to describe the outcomes and impact of an ICU admission during pregnancy or birth.

Outcomes were described through non-parametric analysis of quantitative data collected via the Short Form 36 (SF36), Hospital Anxiety and Depression Scale (HADS), Edinburgh

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Postnatal Depression Scale (EPDS), Pittsburgh Sleep Quality index (PSQI) and Postnatal Bonding Questionnaire (PBQ). Outcomes concluded that at six weeks after birth, women who received care in the ICU during pregnancy or birth were more limited in their physical ability to conduct daily activities, had some aspects of poorer sleep, and were more anxious when compared to healthy women who had a normal vaginal birth. However, there was no difference between the two groups in postnatal depression, or bonding with their baby.

The impact of an ICU admission during pregnancy or birth was explored through semi-structured interviews with a sample of five women. The interviews were conducted at approximately six weeks after the woman had given birth. Qualitative analysis was conducted using thematic analysis. Three themes emerged to reflect the women's experience:

- Responding to the situation: being anxious, managing anxiety, moving on
- Being separated from the baby: physical isolation, emotional concerns
- Being a supportive partner: being present, being a protector

The findings of this study will fill a gap in the knowledge of the experience of women who are admitted to ICU during pregnancy and birth and will inform the development of models of care to better meet the needs of women who require this level of care.

Institutional ethical approval was provided to conduct this study.

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Preamble

The origins of this study are steeped in my professional life working with women during pregnancy, birth and the postnatal period. While most women experience a healthy pregnancy and birth and begin their journey to motherhood in the prime of their life and in good health, some women experience complications that require complex medical interventions in a critical care environment far removed from their expected maternity setting. As a Clinical Midwifery Consultant, I provide direct clinical care to these women in the intensive care unit (ICU) of the hospital where I am employed. The ICU nurses are the primary carers and commonly, are not midwives nor have any maternity care experience. I spent many hours providing midwifery care for the women and their families including bringing their babies from the neonatal unit for skin-to-skin contact, breastfeeding and cuddle time. For the most part, the women recover quickly and are discharged from hospital within a few days of transfer from ICU to the maternity ward. In general, the women return to their General Practitioner for follow up care and are rarely seen again in the women's health care services until they return for a subsequent pregnancy. I often wonder how these women recover and what impact their experience had on their life.

The A/H1N1 influenza pandemic was contained to a few months during 2009. Many people across the world required intensive medical treatment in ICU and people died of respiratory failure or related complications. The physiological processes of pregnancy have a profound effect on a woman's ability to respond to infection. These physiological processes combined with reluctance of health professionals to immunise woman against influenza and reluctance of women to be immunised left pregnant women vulnerable to contracting the disease.

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Pregnancy became one of the highest risk factors for 2009 A/H1N1 influenza and was one of the main reasons for pregnant women to be admitted to ICU during that period of time. The effect of this disease became personal to me when one of my staff midwives, Sally, contracted A/H1N1 during the pandemic.

Sally was in the mid-second trimester of her second pregnancy when she contracted the disease. As a healthy woman without any previous pregnancy or birth complications, she had booked into the birth centre and was planning a normal birth, free of drugs and medical interventions. However, A/H1N1 influenza rendered her with respiratory failure, ventilated and unconscious in the ICU for more than six days. While Sally did recover from her disease and is now well, her experience of being very ill and in the ICU caused her to have unmet expectations for her pregnancy and had a profound influence on her experience of mothering her newborn baby. I began to think, if this is the effect on a health professional with deep understanding of wellness, illness, medical procedures, pharmacology and the ability to rationalise her experience, how do women and families without this level of knowledge recover from an ICU admission and transition to motherhood?

Sally's story

The following is an excerpt from Sally's story (printed with permission):

The 2009 H1N1 virus had a substantial effect upon the Australian population and no doubt affected everyone in some way. From the period June 1 through to August 31 2009, there were 722 patients with confirmed infection of H1N1 virus admitted to intensive care units

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across Australia and New Zealand. Included amongst these admissions were 66 pregnant women, myself being in the numbers.

July 13th shall be a day to remember for me for all the wrong reasons. My husband left very early for yet another long work trip and when I eventually rose for the day remember thinking "oh crap I'm getting the flu"...and what a flu it was! I soldiered on through that week. My husband was persistent, each night on the phone from the Northern Territory to go to the doctor, but again my response was "it's just the flu".

I remember specifically, I had most concern for my aches and pains and particularly my back and hips. It is still hard to believe how this flu knocked me down so fast and severely in just a few short days.

After twenty-four hours in hospital, multiple arterial blood gases, several Intensivist reviews and desperation for a diagnosis, I was transferred to Intensive care. By now my memory is sketchy ... I remember the trip down the corridor but nothing else of that night, just waking up on Tuesday morning and, for breakfast, was offered some Continuous Positive Air Pressure (CPAP)! Having worked in ICU prior to my midwifery, I always maintained that CPAP would have to be your worst nightmare and how anyone tolerates it is beyond my comprehension with a tight mask, pressurised air coming into your face and down your throat! I had my first session and only lasted 30 minutes. I remember Jeannine (my caseload midwife) visiting me and me telling her "I can't do this anymore" I was tired of breathing ... Crazily enough I requested ventilation as I felt I just needed a rest for a few days to get some strength back to be able to breathe again on my own. I had lost insight by this stage. So, I fit the statistics and was one of the 44 pregnant women requiring mechanical ventilation.

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I was ventilated for a total of 6.5 days. During that time so much happened unbeknown to me. Turns out, I was truly the nightmare ICU patient to nurse. Double strength Midazolam and Fentanyl; Very tube intolerant; Does not obey commands; Aggressive; Tries to self-extubate. There were days I had to be shackled to the bed to stop me climbing out or pulling my endotracheal tube out. During this time so much was going on around me that I only know from the stories I have since been told, a note book of support notes from my colleagues and a diary that my sister kept of what went on while I was sleeping.

I did express my choices regarding my pregnancy before going on the ventilator. However, this did not seem to lessen the pressure of such a stressful situation for my husband. Daily, he was confronted by neonatal intensive care unit staff with hypothetical scenarios and possible outcomes. He relied on Jeannine (Sally's caseload midwife) a lot through these times to maintain my wishes and understand where all parties were coming from.

One of the biggest struggles for me still is the psychological damage from ICU and all the drugs required for patients receiving such intense treatment. And I have lost from my memory seven days and six nights and cannot tell you the events that took place while I was sleeping, as I have no recollection at all. When I did 'come to' in the middle of the night after extubation I was completely disorientated.

The effect of me being in the isolation room of ICU led to me feeling locked up and under observation for some time after my discharge from ICU. I was so relieved to be on maternity ward with all my dear colleagues looking after me but, my delusions and inability to sleep on my own were so strong and thought consuming. I thought that every time I closed my eyes, my bed was surrounded by doctors and medical students, and they were all standing there

staring at me, just because they could. This was so real that the only way to get rid of them was to open my eyes to check that they weren't there. Sleeping was so hard.

I do know that I didn't enjoy being in hospital, as there were too many hard things about it that I thought would go away if I were at home. But no, the delusions and inability to sleep continued at home.

So, medically I was over the worst of it and on the recovery road. But for me I would still be fighting a few battles for a while to come. After twenty-four hours at home the next hurdle - hives and in a big way. From a slow start of itchy feet, to be covered from waist down with enormous welts all over my legs. The only answers anyone could come up with were a bad reaction to one, some or many of the drug toxins that were circulating through my system. I would just have to give it time for my body to process and excrete them and was prescribed more drugs to treat more symptoms. Now I could rattle, Temazepam to sleep, Phenergan for the itch, and Paracetamol for the general aches and good luck. My whole drug free pregnancy was long gone now. Oh, and the midwifery model was a dream long gone with weekly medical checks and, by the way, forget about the birth centre birth. No more work, medically controlled pregnancy including a record number of ultrasounds and you can imagine the labour and delivery plans that were in place for me.

I do think I look at life differently after my illness. Every day my head accepts more and more how sick I really was, but I try not to think too hard about it as I am here today and now and I have a job to do as a mother, a wife, a friend, a daughter, a sister and a midwife and I want to do that as best I can. I cannot imagine my journey without the continuity of one midwife and Jeannine held such strength for us both through it all and a lifelong friendship to follow.

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Jeannine had been through all the ups and downs of the rollercoaster journey and I really think I felt so safe at the end because of that. My story continues and thankfully today I am here and fully recovered to tell all. I had an amazing birth and amazing journey through to the end.

Chapter 1 Introduction

1.1 Introduction

Pregnancy and childbirth are recognized as transitional and transformational periods in a woman's life with heightened levels of emotion and anxiety (Jomeen & Martin, 2008). The physical changes in a woman's body as she grows, births and nurtures her newborn baby are apparent. Significant adjustments of the woman's physiology and metabolism, caused by the hormonal changes during pregnancy, are required for the physical and emotional changes to occur. This modification of the pregnant body means that the admission of a pregnant or postpartum woman to an Intensive Care Unit (ICU) is likely to represent an episode of significant maternal morbidity (Buist, Holt, Nayyar, Baghurst, & Antoniou, 2008). While the need for critical care support and admission to an ICU is relatively uncommon for pregnant and postpartum women in the developed world, it does occur. The incidence is estimated at rates of around 0.17% to 1.1% of pregnant patients (Martin & Foley, 2006). Benchmarking by Women's Hospitals Australasia indicates that, in Australasia during 2005-2006, the rate of maternal admission to an ICU during the same hospital admission as birth was approximately 0.2 % of the 94,170 women who gave birth during that period (Buist et al., 2008).

Severe acute maternal morbidity (SAMM) also known as a maternal near miss event (MNME), refers to a very ill pregnant or recently birthed woman who has come close to death as a result of a serious complication during pregnancy or the perinatal period. Maternal near miss events tend to strike with urgency (Elmir, Schmeid, Wilkes, & Jackson, 2010). Obstetric complications are the most common cause of MNMEs and include haemorrhage and hypertensive disorders (Martin & Foley, 2006) . Other causes include respiratory failure and

sepsis, cardiac disease, trauma, anaesthetic complications, cerebro-vascular accidents, drug overdose (Gilbert et al., 2003; Martin & Foley, 2006) renal, haematological and endocrine disorders (Collop, 1993; Lawton et al., 2010). Epidemiological studies in Australia have reported rising rates of maternal morbidity associated with obstetric complications (Cameron, Roberts, Olive, Ford, & Fischer, 2006; Ford, Roberts, Simpson, Vaughan, & Cameron, 2007) that can lead to admission to an ICU.

Commonly, women remember their birth experiences with emotion and in detail. Fenwick, Gamble, Nathan, Bayes, and Hauck (2009) found that many Australian women are anxious about their childbirth experience and interventions such as emergency caesarean section impact on the woman's psychological wellbeing. The woman's anxiety is demonstrated by behaviours such as being less likely to attend postnatal visits, more likely to relive and dwell on their birth experience and have difficulty with their adjustment to motherhood when compared to mothers who do not perceive themselves to have experienced traumatic birth (Fenwick et al., 2009). Extreme fatigue and the pressure of the additional responsibilities of a new baby can impact on the woman's capacity to care for her baby (*beyondblue*, 2011). Australian studies have consistently found the rates of depression of women during the antenatal period to be around 9% and during the postnatal period at 16% (Buist et al., 2008). However, women report not recognizing symptoms of distress, believing that what they are experiencing is a normal part of motherhood (*beyondblue*, 2011).

The emotional distress women experience from complications occurring during pregnancy or in the postnatal period can be traumatic. Birth trauma is described as an event that occurs during any phase of the childbearing process that involves actual or threatened serious injury or death to the mother or her newborn (Beck & Watson, 2008). Traumatic birth experiences and

illnesses can affect a woman's functioning, the way she interacts with others and have an impact on relationships within the family (Ayres, 2007; Elmir, Schmied, Jackson, & Wilkes, 2012). These events can also result in symptoms of psychological trauma or post-traumatic stress disorder (PTSD) (Ayres, 2007; Gamble & Creedy, 2004, 2007; Leeds & Hargreaves, 2008). Importantly, MNMEs can impact on early mothering practices and long-term breastfeeding (Elmir et al., 2012).

Parental mental health is widely acknowledged to be a key determinant of the long term development and health of the child (Buist et al., 2008). There has been increasing recognition that the relationship between a mother and her baby commences during pregnancy (Alhusen, 2008) and increases over the course of the pregnancy, laying the foundation for the mother-infant attachment in the postnatal period (McFarland et al., 2011). While varying in intensity, the woman expressing thoughts and feelings about her baby evidences this relationship as does the woman making lifestyle changes that will promote the health of her fetus and newborn baby (McFarland et al., 2011).

Women who experience severe postpartum haemorrhage describe shock and distress at seeing a large pool of blood, detachment from their body and fear for their life with vivid memories, flashbacks and nightmares as a continuous reminder of their trauma (Elmir et al., 2012) describe how flashbacks of a traumatic birth intrude a woman's life especially during breastfeeding, causing great distress for her. A domino effect is described to include the infant responding to the emotional state of their mother and becoming upset, poor feeding, insufficient milk supply and detachment from the baby with women ultimately ceasing breastfeeding in attempt to become closer to her normal self (Beck & Watson, 2008).

The Australian Maternity Outcomes Surveillance System [AMOSS], funded by the National Health and Medical Research Council [NHMRC], identifies that while individual occurrences of rare obstetric conditions such as eclampsia and major obstetric haemorrhage are uncommon, as a group, these rare conditions cause severe maternal morbidity and considerable burden to women, their families and the health sector. The rarity of these conditions makes them difficult to study and there is a paucity of data about the incidence, risk factors and outcomes (Pollock, Rose, & Dennis, 2010). Accurate information about severe maternal morbidity in developed countries is therefore limited. Furthermore, AMOSS (2009, in National Health & Medical Research Council, 2010) has identified that clinical practice is rarely based on a robust evidence base and argues that as maternal mortality in Australia is rare, studies into 'near miss' events may give better insight into the experiences of mothers and a better understanding of how nurses and midwives can support them.

1.2 Aim of study

The aim of this study was to explore the health and wellbeing of women who experience an ICU admission for severe maternal complications during pregnancy or birth.

1.3 Research Hypothesis

The experience of women with severe maternal complication resulting in admission to ICU during pregnancy or birth impacts on their health and wellbeing.

1.4 Purpose of the study

The purpose of this case study was to describe the outcomes and impact of an ICU admission for severe maternal complication during pregnancy or birth period and compare the health and wellbeing outcomes of this group of women with those of healthy women who had given birth to heathy babies. The findings of this study offer insights into women's experience of severe maternal complications and admission to ICU during pregnancy or in the postnatal period.

1.5 Research questions:

1. How do women who experienced severe maternal complications requiring admission to ICU during their pregnancy or during the postnatal period describe their health and wellbeing soon after discharge from ICU?
2. How do women who experienced severe maternal complications requiring admission to ICU during their pregnancy or during the postnatal period describe their health and wellbeing at six weeks after birth?
3. How do women who experienced severe maternal complications requiring admission to ICU describe their experience?
4. What are the health and wellbeing similarities and differences between healthy women and women who have experienced ICU admission at six weeks after birth?

1.6 Overview of Study Design

An embedded case study was conducted. Embedded within the case are two units of study. The first unit of study is women who experienced an admission to ICU as a result of severe maternal complications during pregnancy or birth. The second unit of study is healthy women who gave birth within a continuity of a midwifery care model at the same hospital. Multiple methods of data collection were used to measure the physical and emotional health of women over the first six weeks of the postnatal period. The findings of the women admitted to ICU during pregnancy or birth were compared to those of healthy women, to provide an in-depth picture of the case (Freeman, Baumann, Fisher, Blythe, & Akhtar-Danesh, 2012; Polit & Beck, 2008; Stewart, 2014).

This methodology provided flexibility as the case was identified as highly contextualised and unsuitable for a controlled study (Yin, 2014). Multiple methods of data collection embedded in the research design enabled the story of the case to be told in ways that explain the complexities of the life experience.

1.7 The importance of this study: Becoming a mother

The prospect of becoming a mother is a period of anticipation and exhilaration for most women (Lonstein, 2007), however the pathway has been increasingly challenging for women in western society (Barclay, Everitt, Rogan, Schmied, & Wyllie, 1997). While pregnancy and child bearing are recognised as normal physiological processes (International Confederation of

Midwives [ICM], 2014) standard maternity care in Australia is provided within a biomedical model where pregnancy is risk assessed and treated, and for most, includes an acute admission to a hospital for birth. Women have reported unmet maternity care needs resulting from inconsistent information provided by their health care providers, specifically in the postnatal period, and insufficient information regarding parenting and breastfeeding (McKinnon, Prosser, & Miller, 2014). Care for women who experienced severe complications of pregnancy or other morbidities has been reported as variable, uncoordinated and fragmented with limited options available for home or community based services (Kingwell, Butt, & Leslie, 2017).

The pathway to becoming a mother is seen as complex. Rogan, Shimed, Barclay, Everitt, and Wyllie (1997) described this pathway to involve every part of the woman's being. While the physical changes of becoming a mother are visible, the emotional, psychological and spiritual adaptations the woman makes are often not readily evident. Rogan et al. (1997) explored the pathway to motherhood with 55 first time mothers from Western Sydney, Australia. They identified that, for the mothers in their study, motherhood was a progressive learning process which left the women feeling exhausted, alone and with a sense of loss as they slowly gained confidence in their ability to care for their baby. The rate at which this confidence grows is influenced by the mother's previous exposure to and experience with mothers and babies, the social supports available to the mother and the behaviour of her baby (Rogan et al., 1997).

Theories of maternal-infant attachment identify that cognitive actions, emotional responses and unique behaviours are required to carry out the function of being a mother (Rogan et al., 1997). Clinical research in human and non-human primates clearly demonstrates the quality of early nurturing strongly influences social function and the capacity to cope with stress in

later life (Pedersen, 2004). The role and function of being a mother is important to the ongoing development of the infant for their whole life.

Alhusen, Hayat, and Gross (2013) argued that maternal attachment is biologically driven to ensure the species is preserved through nurturing and protective behaviours. To become maternal, the neuropeptide systems that facilitate maternal behaviour must undergo a dramatic increase in activity (Bosch, 2011). Oestrogen and progesterone are sex steroids produced in the ovaries by the corpus luteum during the very early stages of pregnancy and then the placenta, from about seven weeks gestation (Pairman, Pincombe, Thorogood, & Tracy, 2015). Oestrogen and progesterone activate, inhibit and regulate other hormone systems (Buckley, 2009) so that pregnancy is established, maintained and, when terminated, followed by the initiation and maintenance of lactation. This physiological process is achieved by changing balances of oestrogen and progesterone throughout the pregnancy, birth and postnatal period. High oestrogen and falling progesterone levels that stimulate milk production also trigger the onset of maternal behaviour (Pedersen, 2004). The maintenance of the maternal response to her offspring becomes independent of sex steroids and less dependent on neurotransmitters over time (Pedersen, 2004) . The brain systems that motivate humans to form emotional bonds with other humans is triggered to ensure that the high quality maternal care necessary for reproductive success in placental mammals occurs (Pedersen, 2004).

The establishment of emotional bonds between a mother and her newborn baby is important to their ongoing attachment during times of stress. Prospective studies show significant correlations between the quality of a mother's care giving and their attachment to their infant. The amount of mothering received in infancy influences the ability of the infant to form

social bonds and secure in social relationships throughout their life (Alhusen et al., 2013; Pedersen, 2004). While women who have a positive mood are likely to experience less anxiety, there is potential for maternal physical and psychological stress because of many factors including expectations of family and friends, worry about the health of the fetus and the newborn baby, worry about the effect of the newborn on their relationships and their ability to care for their infant (Lonstein, 2007; White, McCorry, Scott-Heyes, Dempster, & Manderson, 2008). Stress responses occur under the influence of steroid hormones entering the brain and directly affecting cellular activity and function after the birth of a baby. The hypothalamic-pituitary-adrenal axis response to stressors is suppressed during late pregnancy because of increased placental release of cortical-releasing hormone (Lonstein, 2007). These steroid hormones influence neurotransmitter systems that regulate serotonin, noradrenaline and dopamine, which are modulators of anxiety (Pedersen, 2004). Anxiety is reported to be reduced by breastfeeding as prolactin and oxytocin are into widespread areas of the brain as progesterone levels fall following birth (Lonstein, 2007).

Reduced anxiety is a result of adaption in the maternal brain where it has been shown that increased oxytocin and prolactin levels have anxiolytic properties thought to protect the breastfeeding mother from overreacting to stressful stimuli and promoting successful lactation (Bosch, 2011; Carter, Altemus, & Chrousos, 2001; Lonstein, 2007). Breastfeeding mothers are more likely to describe positive mood states, interact more positively with their babies, have lower sympathetic nervous system arousal and are less anxious when compared to non-lactating mothers (Carter et al., 2001).

While birth is commonly viewed as a normal physiological event for most women with positive outcomes, there is substantial re-adjustment for the woman and her significant

relationships following the birth of a baby (Ayers, Wright, & Ford, 2015). This readjustment is commonly demonstrated through hypervigilance of the safety of the baby and concern for the baby's welfare. As established earlier in the chapter, there is evidence that prenatal psychological distress has an effect on behavioural, cognitive and psychomotor development of the infant and there is an association between postnatal distress and cognitive development (Alhusen et al., 2013; Kennedy, 2010; Kingston, Tough, & Whitfield, 2012).

Advances in medical technology enables women with higher risk pregnancies and complications acquired during pregnancy or birth to safely become mothers. Frequently, these women will require admission to hospital for ongoing care and, sometimes they will be highly dependent on medical, midwifery and nursing care. White et al. (2008) found that these women may experience higher levels of anxiety associated with their risk status, separation from their family and loss of control over their experiences when compared to women with low risk pregnancy. For most women, the disparity between expectations of birth and actual experience are reported to lead to fear, disappointment, anger and lowered self-esteem (Hillan, 1992). Furuta, Sandall, and Bick (2014) found several women who experience severe maternal morbidity perceive their experience as negative, with feelings of physical and emotional distress and pain with distress worsening if the care is perceived to be mismanaged or inadequate. However, little is known about the recovery of these women or the longer term the impacts and outcomes on the individual woman, her baby and her relationships.

1.8 The Australian maternity care context

Maternity care in Australia is provided by midwives, obstetricians and general practitioners in the public and private health sectors (Hildingsson et al., 2016). This maternity system has evolved under the influence of a federated system of government (Bogossian, 1998) and formed by the history of Anglo-Saxon convict settlement (Fahy, 2007). From the early twentieth century until 2010, the practice of midwifery was regulated and controlled by state based nursing boards. General nurse training was pre-requisite to the study of midwifery and, until the late twentieth century, midwifery practice was legislated to be performed under the supervision of a medical practitioner (Bogossian, 1998). This sequence ensured that midwifery remained a specialty of nursing, for the majority of the twentieth century (Hildingsson et al., 2016).

The feature of a quality maternity system, it is argued, to be aligned with the community it serves (McKinnon et al., 2014). Increasingly, the community has demanded reform in the maternity system so that they have equitable access to culturally competent, evidenced based care provided by a qualified workforce (McKinnon et al., 2014). Since 1989, this demand has led to the independent review of the maternity service of each state and territory of Australia with the most recent being a Commonwealth review. The Commonwealth review culminated in the formulation of the National Maternity Services Plan released in 2011. The National Maternity Services Plan confirmed a wellness paradigm as the underpinning philosophy of primary maternity care recognising birth as a normal physiological event (Commonwealth of Australia, 2011).

Chapter 1 Introduction

A large body of evidence exists to support midwifery care as a quality primary care option for women across the pregnancy, birthing and postnatal continuum of care (Homer, 2016; McLachlan et al., 2012; Sandall, Soltani, Gates, Shennan, & Devane, 2016; Tracy et al., 2013). Each state review and the Commonwealth review have recommended that maternity services be reorganised so that women have greater and equitable access to quality maternity care (Catling & Homer, 2016; Commonwealth of Australia, 2011). While there has been ongoing dialogue exploring options that meet the needs of all stakeholders between women, midwives, legislators and the medical organisations, the organisational change of maternity care from fragmented medical care models to community based care models remains limited across Australia (Homer, 2016). Sidebotham, Fenwick, Rath, and Gamble (2015) found that midwives themselves do not believe that change will occur and have moved to passive acceptance of the current service delivery models of maternity care in response to their belief.

Hildingsson et al. (2016) argue that limited appreciation of the value of normal birth and primary maternity care in Australia is impeding reform in the maternity system. Catling and Homer (2016) assert this is influenced by the politics of maternity care where public funding focused on the acute care sector, and financial incentives to the private sector favours maintenance of medical led models of maternity care. This fosters reluctance from health service managers and administrators across both sectors to support wide spread implementation of community based midwifery models of care (Homer, 2016). Consequently, maternity care continues to be provided in fragmented models of care by midwives, obstetricians and general practitioners (Hildingsson et al., 2016) with ongoing conflict between the professions about the boundaries of care (McIntyre, Francis, & Chapman, 2012).

1.9 Significance for nursing and midwifery

Nursing and midwifery aim to provide holistic care as a central tenet to the philosophy of the two professions. Midwives are in a unique position to support the woman, as she becomes a mother through all stages of pregnancy, birth, through the postnatal period and beyond. Throughout the continuum, midwives provide care, information and feedback to the woman while identifying and addressing each woman's unique concerns and fostering her mothering skills as she becomes a mother (Mercer, 2006). Nurses caring for pregnant and postnatal women in the intensive care unit environment report being unable to translate their critical care clinical skills to the maternity context, reporting they lack competence to care for this unfamiliar group of patients (Kynoch, Paxton, & Chang, 2010). The critical care nurse focuses on prioritizing care and providing physical care for the woman, leaving the woman's partner to take responsibility of caring for the baby and being the link to the neonatal unit (Engström & Lindberg, 2013).

The findings of this study will add to the body of knowledge of nursing and midwifery. This will inform the development of midwifery models of care for women who experience severe complications during pregnancy or birth.

1.10 Rationale for the study

There is a growing body of knowledge about psychosocial, emotional and spiritual effects of pregnancy, birth and early mothering in addition to the biomedical outcomes. To date, there is

limited published data about the experience and recovery of women admitted to an intensive care admission during pregnancy or in the postnatal period. There are minimal follow up and referral processes in place for women following discharge from an intensive care unit. This study will add a piece to the puzzle and contribute to the total knowledge of pregnancy, birth and early parenting.

1.11 Organisation of thesis

In this thesis, the case of outcomes and impact of an ICU admission for severe maternal complications during pregnancy or birth is examined and described.
The first chapter has presented a background to the study with an overview of the Australian maternity care context and the importance of becoming a mother. The aim, purpose and objects of the study were outlined. The researched questions were presented.

Chapter two reviews the literature related to the admission of a woman admitted to ICU during pregnancy, birth or the postnatal period. The review identifies two main themes in the discussion of the literature: reasons for admission to the ICU and biomedical outcomes of admission to the ICU. It concludes there is limited published literature regarding this topic.

Chapter three depicts the theoretical framework and study design. Pragmatism is described as the theoretical framework for the study. The application of a critical social science lens to explore the topic, focussed by woman centred care is then justified and situated. A discussion supporting the choice of case study methodology to examine the topic and answer the research questions then follows. Ethical considerations related to the recruitment of women are detailed in the final section of this chapter.

Chapter four presents the methods and conduct of the study. A description of the study design as a single case with two groups embedded into the case opens the discussion. This treatise heralds an overview of the data collection methods. The two groups that inform the case and the recruitment process of women to those groups are then described. Demographic information about the two groups is displayed and discussed. The chapter concludes with a detailed description of the data collection tools.

Chapter five delivers the outcome data and findings of the quantitative data. The statistical tests applied to the data collected from each tool are delineated. The results from the statistical tests are demonstrated followed by statistical description of the findings. Statistically significant findings are analysed and discussed.

Chapter six explains the impact of an admission to the ICU through analysis of the qualitative data. Data reduction findings are portrayed as three main themes, each with sub-themes identified. Each theme and sub-theme is examined through the words of the women.

Chapter seven draws the findings of the quantitative and qualitative data together to describe the case of the outcomes and impact of an ICU admission during pregnancy and birth. The key findings are situated within the existing literature and within the context of maternity care in Australia.

Chapter eight is the final chapter of this thesis. The researcher provides reflections on the research. The strengths and limitations of the study are canvassed. The methodological rigour and quality processes are outlined with justification for the chosen method of assessment of rigour. Recommendations of the study are defined concerning the domains of midwifery

practice, midwifery education and midwifery research. The chapter concludes with a statement of the case.

1.11 Chapter Summary

This chapter has provided the reader with background to the study. The aim and purpose of the study were described and the research questions stated. The importance of becoming a mother was explained. This discussion was then situated within nursing and midwifery practice. The chapter concludes with an outline of the structure and organisation of this thesis. Chapter two provides a summary of the literature related to the outcomes and impact of an admission to ICU during pregnancy or birth.

Chapter 2 Literature Review

This chapter provides an overview of the literature that informed the background of this study. The background to the literature review will be discussed and the purpose identified. The methods utilised to conduct the review will be described. The results of this review identify two main ideas: reasons for admission to ICU during pregnancy or the postnatal period and the outcomes of the admission. The following discussion will concede there is a paucity of literature related to the impact and outcomes of pregnant and postnatal women admitted to the intensive care unit.

2.1 Introduction

Access to antenatal care provided by skilled health practitioners and a standard of living where high quality food, health education, and treatment of illness is readily available are widely recognized as contributing to low maternal mortality in high income countries (Leung, Lau, Chan, & Yan, 2010). Low maternal mortality rates have led to the analysis of maternal near miss events increasingly being used as an indicator of the quality of maternity services with admission to the intensive care unit (ICU) used as the marker for severity of morbidity (Chantry, Deneux-Tharaux, Bonnet, & Bouvier-Colle, 2015; Furuta, Sandall, & Bick, 2014; Lawton et al., 2010; Pollock et al., 2010; Togal et al., 2010; Wanderer et al., 2013).

The definition of maternal morbidity is variable (Furuta, Sandall, & Bick, 2014; Pollock et al., 2010), with severe acute maternal morbidity, otherwise described as a maternal near miss event, referring to a very ill pregnant or recently birthed woman who has come close to death as a result of a serious complication during pregnancy or the perinatal period (Cecatti, Souza,

Parpinelli, de Souza, & Amaral, 2007; Mantell, Buchmann, Rees, & Pattinson, 1998; Patterson & Hall, 2003). Maternal near miss events tend to strike with urgency and are usually not predicted (Elmir et al., 2012; Hinton, Locock, & Knight, 2015). While the need for critical care support and admission to an ICU is relatively uncommon for pregnant and postpartum women in the developed world, it does occur. Epidemiological studies have reported maternal morbidity is primarily associated with obstetric complications (Cameron et al., 2006; Crozier & Wallace, 2011; Ford et al., 2007; Hinton et al., 2015; Ray, Urquia, Berger, & Vermeulen, 2012).

Life threatening events leading to admission to ICU and experiences during admission to ICU provide potential for the woman to be exposed to traumatic events. Traumatic birth experiences and illnesses can affect a woman's functioning and the way they interact with others (Ayres, 2007; Elmir et al., 2010; Furuta, Sandall, & Bick, 2014). These events may result in symptoms of psychological trauma or post-traumatic stress disorder (Gamble & Creedy, 2004, 2007; Leeds & Hargreaves, 2008). Importantly, maternal near miss events can impact on early mothering practices and long term breastfeeding (Elmir et al., 2010).

2.2 Purpose

The purpose of this literature review was to identify and appraise the literature related to the outcomes of care following the admission of pregnant or postpartum women to the ICU and to identify gaps in the literature. The identified gaps found in this literature review informed the development of the research methodology and research questions that guided this research project.

2.3 Methods

An integrative literature review was undertaken. As the broadest type of research review, diverse methodologies were able to be considered enabling the researcher to explore the literature related to the outcomes of an ICU admission during pregnancy or in the postnatal period (Whittemore & Knafl, 2005). The review method included identifying the problem to be addressed, identifying the appropriate databases to be searched as well as appraisal and analysis of the data presented (Whittemore & Knafl, 2005).

The initial review was undertaken in May 2011 to identify English language publications linked to full text, peer reviewed articles published between January 2001 and December 2010. A follow up review was conducted in March 2017 using the same search strategy and search limitations as the original review to identify new publications for the period between January 2011 and December 2016. The databases CINAHL, Medline, Ovid SP, ProQuest and PsychINFO were searched using the search terms *pregnancy or postnatal or perinatal or obstetric* and *intensive care unit or critical care* and *outcomes or quality of life*.

The initial database search identified 2329 abstracts. The follow up data base search identified 585 abstracts. Duplicate articles were removed. Excluded in the screening phase were abstracts where the purpose of the paper was to discuss the care and treatment of babies admitted to neonatal ICUs. Case reports, where the aim of the paper was to describe pathophysiology or medical treatment of specific pregnancy or non-pregnancy related conditions, were excluded. Opinion pieces were removed, as were books, editorials and articles from non-English journals.

From the initial search, sixty-eight articles were downloaded for review with an additional fifteen articles downloaded in the follow up search. Those articles describing or evaluating ICU patient dependency or therapeutic scoring systems were then excluded as were articles where the purpose was to describe outcomes related to the clinical management of aspects of care such as airway, fluid volume and medication management. Articles describing ICU care in countries classified by the World Bank as lower middle and low-income countries were then excluded. An additional article that met the inclusion criteria was included based on reference list hand search.

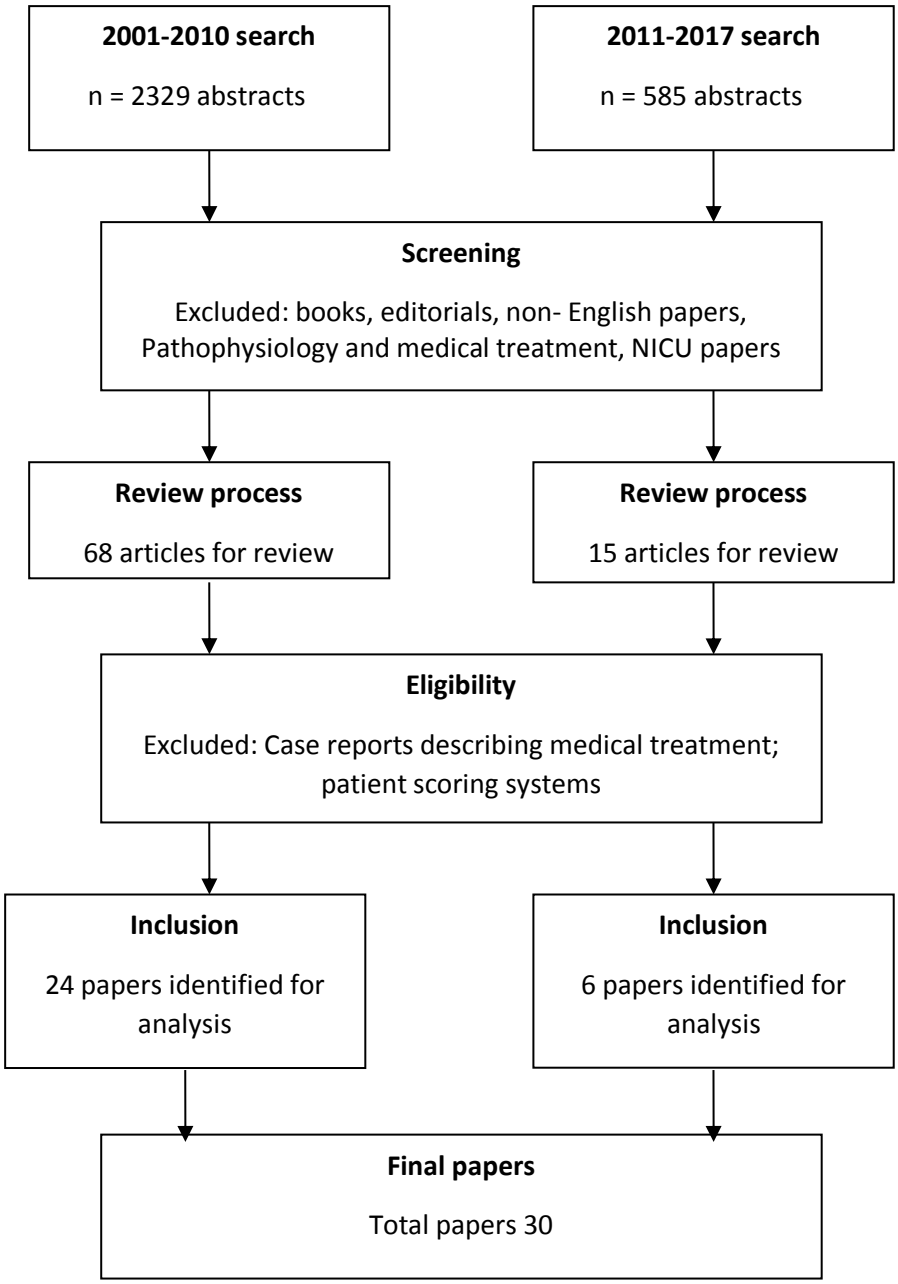

Figure 2. 1 Literature review screening process

2.4 Results

A total of thirty (30) journal articles were reviewed. Twenty-four journal articles met the criteria during the initial review; and six articles met the criteria in the follow up review.

Across both reviews, the largest number of articles originated in the United States of America (USA) (n = 11) followed by United Kingdom (n = 6), Australia (n = 5) and The Netherlands (n = 2) with single articles from France, Canada, Spain, Brazil, Hong Kong and Turkey. In the initial review, fifteen articles discussed obstetric and other reasons for admission to the ICU: one systematic review, one comparative study, one meta-synthesis, one literature review, two population based cohort studies, two retrospective cohort studies and seven case series reviews. Nine articles reviewed discussed A/H1N1 influenza as the reason for admission to the intensive care of pregnant or postpartum women during the 2009 pandemic: four population based cohort studies, two case series, two observational and one cross sectional study. An additional six articles were examined in the follow up review: two population based descriptive studies, three cohort studies and one systematic literature review. Outcomes of care in the original review were predominantly described in biomedical terms including maternal morbidity and mortality rates while in the follow up, half of the articles described outcomes of care as psychosocial outcomes using narrative description.

The articles chosen for analysis were divided into sub-groups based on the study findings. The subgroups were reason for admission to the ICU and outcomes of maternity care. The key discussion of each study is recorded in Table 2.1. Those articles relating to obstetric reasons for admission conducted in high income and upper middle-income countries were purposely chosen to ensure the reported outcomes related to similar levels of obstetric care, intensive care and health service resourcing.

The studies relating to the 2009 A/H1N1 influenza formed the largest volume of literature related to pregnant or postnatal women requiring admission to the ICU. The studies were conducted in the northern and southern hemispheres reflecting the pandemic nature of this

virus. These publications aimed to establish pregnancy as a risk factor to 2009 A/H1N1influenza within specific geographical locations or, to describe the epidemiological characteristics of the disease with emphasis on maternal morbidity and mortality and infant mortality rates as outcomes (Mosby, Rasmussen, & Jamieson, 2011). Additionally, the 2009 A/H1N1 pandemic was the first influenza to occur in the era of modern obstetric and intensive care management to (Australian and New Zealand Intensive Care, 2010).

2.4.1 Reasons for intensive care admission

The most common obstetric reasons for pregnant or postnatal women to require ICU admission were pre-eclampsia, eclampsia, postpartum haemorrhage (Chantry et al., 2015; Hinton et al., 2015; Lawton et al., 2010; Madan et al., 2009; Pollock et al., 2010; Wanderer et al., 2013; Zwart, Dupuis, Richters, Ory, & Roosmalen, 2010). The majority of obstetric related admissions occurred during the postnatal period (Chantry et al., 2015; Crozier & Wallace, 2011; Gilbert et al., 2003; Keizer et al., 2006; Leung et al., 2010; Zwart et al., 2010). Wanderer et al. (2013) reported increasing ICU admission rates for sepsis and trauma and decreasing admission rates for anaesthetic complications while obstetric reasons for admission to ICU have remained constant over time. The main reason pregnant women required admission to ICU admission was respiratory failure resulting from infection during the 2009 A/H1N1 pandemic (Australian and New Zealand Intensive Care, 2010; Dubar et al., 2010; Louie, Acosta, Jamieson, & Honein, 2010; Maravi-Poma et al., 2011; Siston, Rasmussen, Honein, & et al., 2010). These admissions were primarily limited to a period of twenty-six weeks during 2009 and 2010.

Madan et al. (2009) found that women with pre-existing conditions were at increased risk of admission to the ICU. A retrospective cohort study by Cartin-Ceba et al. (2008) reported

almost half of the pregnant women had a pre-existing chronic medical condition present. Chronic hypertension was identified as the most common medical co-morbidity (Madan et al., 2009; Zwart et al., 2010). Similarly, co-morbidities were found to predispose pregnant women with 2009 A/H1N1influenza to ICU admission, with obesity and asthma the most commonly identified (Australian and New Zealand Intensive Care, 2010; Dubar et al., 2010; Fitzpatrick, Hinshaw, Kurinczuk, & Knight, 2014; Nair et al., 2011; Siston et al., 2010). However, Jiménez et al. (2010) and Maravi-Poma et al. (2011) found that pregnant women presented with less co-morbidities than non-pregnant women of reproductive age, identifying that the pregnant women were younger and may not have yet developed severe co-morbidities.

Interventions that women experienced during admission to ICU included mechanical ventilation, invasive monitoring, renal dialysis and drug therapies. Extracorporeal membrane oxygenation management in ICU was described in French and Australian A/H1N1 studies (Australian and New Zealand Intensive Care, 2010; Dubar et al., 2010; Nair et al., 2011). However, many pregnant and postnatal women admitted to ICU did not require invasive interventions and potentially could have been managed in other higher dependency care environments if they were available (Crozier & Wallace, 2011; Hinton et al., 2015).

Women of non-western origin had a higher risk of admission to the ICU (Munnur et al., 2005; Wanderer et al., 2013). During the 2009 A/H1N1 pandemic Indigenous women were found to be more at risk to ICU admission even if they resided in high income countries (Australian and New Zealand Intensive Care, 2010; Fitzpatrick et al., 2014; Pramanick, Rathore, Peter, Moorthy, & Lionel, 2011; Siston et al., 2010). Access to care, traditions and

cultural systems were identified as influences that effected these women seeking appropriate and timely care (Zwart et al., 2010).

Delays in seeking and implementing treatment were found to be associated with increased severity of illness (Dubar et al., 2010; Karnad, Lapsia, Krishnan, & Salvi, 2004; Pramanick et al., 2011; Siston et al., 2010). Lawton et al. (2010) and Louie et al. (2010) also argued delays in recognizing abnormal vital signs and failure to recognize risk status during pregnancy and the postnatal period, combined with delayed referral to expert clinicians and inadequate treatment, contributed to the severity of disease and reasons for admission to ICU.

Pollock (2006) identified that there were no established guidelines for the admission and care of pregnant and postnatal women in the ICU. The facility threshold for ICU and the number of ICU beds available may have determined maternal care and management (Wanderer et al., 2013). Gilbert et al. (2003) compared their reasons for admission to the ICU with other case series findings and identified that access to a designated obstetric ICU and specialists in maternal-fetal medicine were important contributors to the reasons pregnant and postnatal women were admitted to an ICU.

2.4.2 Maternal outcomes of intensive care admissions

Maternal outcomes of an ICU admission were primarily discussed in relation to caesarean section rates, days in intensive care and mortality rates. Pregnant and postpartum women admitted to the ICU for postnatal care were more likely to have had a caesarean section. Caesarean section rates were described as 20-80% (Afessa, Green, Delke, & Kock, 2001; Australian and New Zealand Intensive Care, 2010; Borrelli, 2013; Cartin-Ceba, Gajic, Iyer,

& Vlahakis, 2008; Crozier & Wallace, 2011; Hinton et al., 2015; Karnad et al., 2004; Keizer et al., 2006; Leung et al., 2010; Zwart et al., 2010). During the 2009 A/H1N1 pandemic, caesarean section was commonly performed at 33-34 weeks gestation because of the need to treat maternal respiratory failure (Australian and New Zealand Intensive Care, 2010; Centers for Disease Control and Prevention, 2011; Dubar et al., 2010; Pramanick et al., 2011) with overall preterm births occurring in 30% to 80% of all births occurring when the mother was admitted to the ICU (Australian and New Zealand Intensive Care, 2010; Centers for Disease Control and Prevention, 2011; Louie et al., 2010; Siston et al., 2010). Caesarean section rates were found to increase linearly with increasing morbidity and complexity of ICU care required and complications directly affecting fetal prognosis (Cartin-Ceba et al., 2008; Ray et al., 2012). Pollock et al. (2010) identified there was poor understanding of the impact of caesarean section on severe maternal disease because of the dichotomy of some women requiring caesarean section because they were severely ill and others becoming ill as a result of complications of the caesarean section.

Length of stay in the ICU was reported as an outcome of care across all studies reviewed with length of stay dependent on the reason for admission. Women admitted for treatment of severe illness resulting from 2009 A/H1N1 virus required longer stays with median length of stay of 12-13 days (Centers for Disease Control and Prevention, 2010; Dubar et al., 2010; Fitzpatrick et al., 2014) whereas women admitted for other reasons, including obstetric complications, had a shorter median length of stay of 2-7 days (Afessa et al., 2001; Chantry et al., 2015; Crozier & Wallace, 2011; Ray et al., 2012; Vasquez et al., 2007; Wanderer et al., 2013).

Mortality rates were described as an outcome of care. Borrelli (2013) identified that maternal mortality was rare in developed countries. Within the literature not related to the 2009 A/H1N1, mortality rates were 1.3 – 4.9% (Afessa et al., 2001; Chantry et al., 2015; Gilbert et al., 2003; Keizer et al., 2006; Zwart et al., 2010). However, Crozier and Wallace (2011) reported a zero mortality rate in their Australian study while Togal et al. (2010) confirmed a maternal mortality rate of 12% in the upper-middle income country of Turkey. The 2009 A/H1N1 severely compromised the health of pregnant women. Pramanick et al. (2011) reported that 25% of pregnant women died from complications related to A/H1N1, compared to 8.3% of non-pregnant women. In Australia and New Zealand, 11% of pregnant and postnatal women admitted to ICU died (Australian and New Zealand Intensive Care, 2010), while in the USA, 21% of severely ill pregnant women died. Centers for Disease Control and Prevention (2011) found that those women admitted to the ICU and received antiviral treatment for 2009 A/H1N1 later in the stage of their infection were 54 times more likely to die than those who received early treatment.

The literature describing ICU admissions of pregnant or postnatal women diagnosed with 2009 A/H1N1 influenza was found to be independent of all other literature related to admission of pregnant or postnatal women to ICU for any other reason. No studies were found where any aspect of research related to A/H1N1 influenza in pregnant or postnatal women was integrated into data reporting or explaining pregnant and postnatal admission to ICU. Borrelli (2013) explained this was related to disproportionate number of women admitted to the ICU during the A/H1N1 pandemic.

Three studies in the original review considered outcomes of care other than biomedical outcomes. The first, a literature review undertaken by Tedstone and Tarrier (2003) found that

post-traumatic stress resulting from physical illness and treatment had the highest rates in patients treated in the ICU. Within the obstetric context, Tedstone and Tarrier (2003) reported women feeling out of control during traumatic birth and were fearful during procedures such as caesarean section as risk factors for stress. Within the ICU context, many potentially traumatic elements were identified including pain, medical procedures, and witnessing events such as resuscitation and the death of other patients. However, there was no integration of the discussion related to these two contexts. The second study explored health and wellbeing outcomes reported on the Short Form-36 (SF-36). The domains of physical functioning, bodily pain and social functioning were found to be lower in the women requiring ICU admission during pregnancy or the postpartum period when compared to women of a similar age who had not been admitted to ICU. It was argued that the intensive care admission had a negative impact on the lives of women admitted to ICU during the pregnancy and birth continuum (Leung et al., 2010). The third study explored the health and wellbeing of pregnant and postnatal women twelve to eighteen months after ECMO treatment for 2009 A/H1N1 related respiratory failure in Australia and New Zealand. These data were gathered using the SF-36 tool. The summary SF-36 scores from this study indicated the physical and mental health components were similar to age and sex matched Australian populations (Nair et al., 2011).

The review update identified two additional qualitative studies investigating the psychosocial outcomes of women through the perception of the women who had required critical care during their pregnancy or postnatal period. Both studies were undertaken in the United Kingdom. A third study, identified in the review update, synthesised the qualitative literature related to women's experiences related to severe maternal morbidity. While this study was inclusive of women who had experienced admission to ICU, it was not exclusively related to

ICU admission (Furuta, Sandall, & Bick, 2014). No uniformity was found in the timing of the data collection in these studies. While Hinton, Locock, and Knight (2014) did not specify the timing of the data collection in their study, Furuta, Sandall, Cooper, and Bick (2014) reported findings related to the specific timeframe of six to eight weeks after giving birth.

Women's responses to the experience of requiring critical care included reactions to the ICU environment and struggling to understand the event that caused their admission (Furuta, Sandall, & Bick, 2014; Hinton et al., 2015). The outcomes of the women's experiences were described in positive and negative terms. Positive terms included personal growth, shared decision making and care for their baby while negative terms were described as distressed, frustrated, not knowing and fear (Furuta, Sandall, & Bick, 2014; Furuta, Sandall, Cooper, et al., 2014; Hinton et al., 2015).

2.5 Discussion

Pollock et al. (2010) described the incidence of an intensive care admission as 0.7-13.5 per 1000 births with pregnant and postnatal women accounting for 0.4 – 16% of all ICU admissions. This literature review identified the most common obstetric reasons for admission of women to the ICU during the antenatal or postnatal period to be obstetric related haemorrhage and pregnancy related hypertensive disorders (Afessa et al., 2001; Borrelli, 2013; Gilbert et al., 2003; Keizer et al., 2006; Leung et al., 2010; Madan et al., 2009; Pollock et al., 2010; Porreco & Barkey, 2010; Togal et al., 2010; Zwart et al., 2010).

A large volume of literature found was published during 2010 following the 2009 A/H1N1 influenza pandemic. The population studies provided larger numbers of women informing the findings of the individual studies. The aim of these publications was to establish pregnancy,

as a risk factor for severe maternal illness requiring admission to ICU within a specific geographical region.

There are few obstetric intensive care units across the world and all women in the reviewed studies were cared for in a general adult ICU. No specific criteria for admission of women to the ICU were found with variable thresholds for admission described including availability of ICU beds and general demand for the available ICU beds. Across all studies reviewed, no consistency was found in the way the data was collected or reported. Crozier and Wallace (2011) described how there were even variable definitions for an "obstetric patient". This caused uncertainty about completeness of the data of pregnant and postnatal women captured in these studies.

While the number of women in most of the case series and cohort studies were small, the population studies highlighted that most women required invasive medical procedures including ventilator support for respiratory and haemodynamic complications. Indigenous and non- Caucasian women across all studies were at higher risk of requiring ICU admission. Their babies were commonly born prematurely or were of low birth weight and required care in the Neonatal Unit (Australian and New Zealand Intensive Care, 2010; Centers for Disease Control and Prevention, 2010; Jiménez et al., 2010; Louie et al., 2010; Ray et al., 2012; Siston et al., 2010).

Pregnant women in the intensive care environment reported a great deal of stress from that environment with separation from their partner, physical discomfort, side effects of medication, feelings of helplessness, isolation and concern for the baby as the main stressors (Furuta, Sandall, & Bick, 2014; Hinton et al., 2015). While Leung et al. (2010) found that this

stress impacted on all aspects of the woman's life, this literature review found these aspects were rarely reported as outcomes of care. As the negative outcomes associated with severe acute maternal morbidity had considerable personal and public health costs, better understanding of the outcomes of care was deemed to be required (Furuta, Sandall, & Bick, 2014; Lawton et al., 2010; Ray et al., 2012).

2.6 Relevance to clinical practice

The presentation of severely ill pregnant and postnatal women requiring admission to the ICU is an uncommon event in most ICUs (Kynoch et al., 2010). Intensive care nurses have identified that meeting the needs of severely ill pregnant and postnatal women is difficult because of the altered physiology of pregnancy and the infrequent presentation of multifaceted pathophysiology (Kynoch et al., 2010). While most women physically recover quickly (Pollock, 2006) immediately following severe illness during pregnancy or in the postnatal period, this literature review has identified that it is unknown how their experience impacts on their health and wellbeing.

Advances in medical and obstetric care enable women with chronic illness and disease to become pregnant and carry their babies through to viability. This review has found that these women are at higher risk of obstetric and non-obstetric complications requiring interventions in the ICU. The role of the midwife and the place of maternity care are scarcely mentioned in any of the studies reviewed. As midwifery models of care are introduced into mainstream maternity care and collaborative care becomes more accessible for women, midwives are increasingly likely to provide care for pregnant and postnatal women who have been admitted to the intensive care unit.

Postnatally, as caseload midwives provide care for women across the continuum for up to six weeks, there is opportunity to record the recovery of these women during the early weeks after birth. Recording women's experiences following severe illness will inform the development of women centred nursing and midwifery practice and development of models of care when women are admitted to the intensive care unit with complex pathophysiology and care needs.

2.7 Conclusion

This review was conducted to identify and appraise available publications related to the outcomes of care following admission of women to ICU during pregnancy or in the postnatal period. Despite the effect of severe maternal morbidity and admission to the ICU on pregnant and postnatal women, little research has been undertaken to explore the outcomes of care of women admitted to the ICU during pregnancy or in the postnatal period. This integrative literature review has identified the majority of research available was case series description and discussions limited to bio-medical outcomes. General health and wellbeing following admission to ICU during pregnancy or the postnatal period is alarmingly under researched. There is a gap in the literature about other outcomes of care for pregnant or postnatal women following admission to an ICU indicating need for further research in this area.

2.8 Chapter Summary

This chapter presented the reason for the literature review, the breadth and depth of the review and the significance of it in relation to the study. It detailed the significant articles and discussed the relevant findings of the articles within two main premises. After a synopsis of

these articles the next chapter will consider the methodological framework that underpins the study and will detail the study design.

Table 2. 1 Literature review table

Title of Article	Year of Publication	Author/s and origin	Source	Nature of research: methods	Summary of findings
Pregnant and postpartum admission to the intensive care unit: a systematic review	2010	Pollock W., Rose, L. & Dennis, C.. Australia	Intensive Care Medicine	Systematic Review: 40 eligible studies (outcomes reported for 7,887 women)	There are no published guidelines for the care of pregnant and postnatal women in the ICU. Individual characteristics such as model of birth, perinatal outcome, ICU utilisation, and women who are admitted to the ICU for <24 hours are variously reported. Reasons for admission are pre-eclampsia/eclampsia followed by obstetric haemorrhage. Caesarean section rate 70%
Obstetric intensive care unit admission: a two year nationwide population-based cohort study	2010	Zwart J., Dupuis, J., Richters, A., Ory, F. & Roosmalen, J. The Netherlands.	Intensive Care Medicine	Original Research: 98 Dutch maternity units participated (outcomes reported for 847 obstetric ICU admissions)	22.8% of admissions antenatal 74.1% of admission postnatal 42% of all admissions due to preeclampsia 27% of all admissions due to obstetric haemorrhage. 12% of all admissions due to uterine rupture. Maternal death rate 3.5%. Non-western women had higher risk of admission to ICU than western women
Audit of severe acute maternal morbidity describing reasons for transfer and potential preventability of admission to ICU.	2010	Lawton B., Wilson, L., Dinsdale, R., Rose, S., Brown, S., Tait, J.,Coles, C. & McCaw, A. Australia	Australian and New Zealand Journal of Obstetrics and Gynaecology	Original Research: Case series review (n= 29 cases)	A study of preventable and non-preventable reasons that precipitated an ICU admission. Differentiated between provider and system related preventable events Provider events can influence the outcome for women A change in provider decision making could give better outcomes for women

Obstetric admissions to the intensive care unit in a tertiary referral hospital	2010	Togal T., Yucel, N., Gedik, E., Gulhas, N., Toprak, H. & Ersoy, M. Turkey	Journal of Critical Care	Original Research: Case series review (n= 73 cases)	The most common reasons for admission are pregnancy related hypertensive disorders (59%), haemorrhage (27%) and respiratory failure (11%) Discussion limited to physiological processes Postpartum morbidity has become the marker for the measurement of the quality of maternity care.
Peripartum intensive Care	2010	Porreco, R. & Barkey, R. United Kingdom	Journal of Maternal-Fetal and Neonatal Medicine	Original Research: Case series review (n= 45 cases)	most common reasons for admission haemorrhage and pregnancy related hypertensive disorders 80% of women admitted had caesarean section 30% of women admitted required mechanical ventilation Admission to ICU is dependent on local factors outcomes of care discussed in relation to caesarean section and baby requirements for admission to NICU.
Clinical Characteristics and outcomes of obstetric patients admitted to the intensive care unit: a 10 year retrospective review	2010	Leung, N., Lau, A., Chan, K. & Yan, W.. Hong Kong	Hong Kong Medical Journal	Original Research: Retrospective cohort study (n= 50 cases)	70% of admissions for obstetric complications 78% of admissions during postpartum period The most common complication was haemorrhage followed by pregnancy related hypertensive disorders and non-obstetric related sepsis. 58% of women were mechanically ventilated 64% of women had caesarean section Maternal outcomes described as maternal mortality SF36 used to evaluate longer term health related quality of life outcomes

Characteristics of obstetric intensive care unit admissions in New Jersey	2009	Madan, I., Puri, I., Jain, N., Grotegut, C., Nelson, D. & Dandolu, V. USA	Journal of Maternal-Fetal and Neonatal Medicine	Original Research: Population based case control study (n=15,447 cases)	Women with pre-existing diabetes, haematological conditions and connective tissue disorders are at increased risk of admission to ICU Multiple pregnancy increased rate of admission to ICU Pre-eclampsia, eclampsia and obstetric haemorrhage are strongly associated with ICU admission Pre-eclampsia is one of the most important factors associated with ICU admission Statistically significant association between caesarean section and ICU admission Perinatal outcomes discussed as maternal and neonatal morbidity and mortality
Fetal outcomes of critically ill pregnant women admitted to the intensive care unit for non-obstetric causes	2008	Cartin-Ceba, R., Gajic, O., Iyer, V. & Vlahakis, N. USA	Critical Care Medicine	Original Research: Retrospective cohort study n= 153 cases)	Chronic medical condition present in >50% of antenatal admissions reasons for admission systemic inflammatory response, respiratory distress syndrome, shock Caesarean section 30% Critical illness during pregnancy and ICU interventions will impact on the outcomes of the fetus Neonatal outcome described by Apgar scores, mortality and NICU admission Maternal outcomes related to morbidity and mortality.
Clinical characteristics and outcomes of obstetric patients requiring ICU admission	2007	Vasquez, D., Estenssoro, E., Canales, H., Reina, R., Saenz, M., Neves, A., Toro, M. & Loudet, C.	Chest	Original Research: Case series review (n=161 cases)	Almost 50 % of women had organ failure shock occurred in 25% of women mainly related to haemorrhage and sepsis Most admissions in postpartum period and were related to hypertensive disorder of pregnancy and haemorrhage The reasons for admission to ICU in developing country are similar to those of

		USA			other studies conducted in developed counties. Maternal and fetal mortality used as measure for outcome.
Caring for pregnant and postnatal women in intensive care: what do we know?	2006	Pollock, W. Australia	Australian Critical Care	Original Research: metasynthesis (n= 7 studies)	Most studies are retrospective, descriptive asn observational. A paucity of research identifies implications for practice and asks if ICU is the appropriate place of care.
Obstetric intensive care admission: a 12 year review in a tertiary center	2006	Keizer, J., Zwart, J., Meerman, R., Harinck, B., Feuth, H. & Roosmalen, J. Netherlands	European Journal of Obstetrics and Gynaecology and Reproductive Biology	Original Research: Case series review (n= 142 cases)	Admissions: 27.5% antenatal 69% postnatal Caesarean section rate 61.4% most common diagnosis pre-eclampsia followed by obstetric haemorrhage. Common interventions mechanical ventilation, blood transfusion and administration of drugs Outcomes discussed as morbidity and mortality Maternal mortality rate 4.9%
Critically ill obstetric patients in an American and an Indian public hospital: a comparison of case-mix, organ dysfunction, intensive care requirements and outcomes	2005	Munnur, U., Karnad, D., Bandi, V., Lapsia, V., Suresh, M., Rameshesh, P., Gardner, M., Longmire, S. & Guntupalli, K.. USA	Intensive Care Medicine	Original Research: Comparative study without concurrent controls (Indian arm n= 745 cases USA arm n= 74 cases)	Obstetric disorders most common reason for admission in both groups. Morbidity and mortality are affected by access to care, economics traditions and cultural systems
Post-traumatic stress disorder following medical illness and treatment	2003	Tedstone, J. & Tarrier, N. United Kingdom	Clinical Psychology Review	Original Research: Literature review (Obstetrics and Gynaecology n=10 studies Intensive Care Unit (n=8 studies)	There was consistency in the rates of PTSD in the studies with a range of 1.7%-5.6%. Perceptions of inadequate care during birth, level of obstetric intervention during birth and technical skills of the staff are possible risk factors for PTSD. One study identifies that 76% of women regarded

					caesarean section as a traumatic event with 55% of women experiencing intense fear during the procedure.
Obstetric admissions to the intensive care unit: outcomes and severity of illness	2003	Gilbert, T., Smulian, J., Martin, A., Ananth, C., Scorza, W., Scardella, A. for the Critical Care Obstetric Team USA.	Obstetrics and Gynaecology	Original Research: Case series review (n= 233 cases)	Admissions: 28% antenatal 72% postnatal 39% of admissions for medical reasons, 36.5% for obstetric complications excluding haemorrhage, 24% for obstetric haemorrhage Maternal mortality rate 3.4%
Systematic inflammatory response syndrome, organ failure and outcome in critically ill obstetric patients treated in ICU	2001	Afessa, B., Green, B., Delke, I. & Koch, K. USA	Chest	Original Research: Case series review (n= 74 cases)	most common reasons for admission included respiratory failure, haemodynamic instability, sepsis and pulmonary oedema from fluid overload heterogenicy of comparison studies and variations of disease severity discussed as an explanation of why there is no consistency in mortality rates and length of stay makes recommendations about fluid management, infection control and control of postpartum haemorrhage

H1N1 Articles reviewed

Title of Article	Year of Publication	Author/s and origin	Source	Nature of research: methods	Summary of findings
Severe 2009 H1N1 infuenza in pregnant and postpartum women in California	2010	Louie, J., Acosta, M., Jamieson, D. & Honein, M. USA	The New England Journal of Medicine	Case series study (n= 94 pregnant and 8 postpartum women)	ICU admission: 18/94 pregnant women and 4/8 postnatal women (total 22). 8/22 were otherwise healthy with uneventful pregnancy prior to acquiring 2009 H1N1. 13 had diagnosis of ARDS & required prolonged

					ventilation. 11 babies were born prematurely. 8 maternal deaths: (6AN & 2 PN) six had underlying medical conditions, maternal mortality rate of 4.3. Pregnant women frequently presented with mild symptoms and had rapid clinical progression and deterioration.
Pandemic 2009 influenza A/H1N1 virus illness among pregnant women in the USA	2010	Siston et al. USA	Journal of the American Medical Association	Population based study (n=788 pregnant women)	ICU admissions 36.4% Hispanic, 29% non-Hispanic white, 14% non-Hispanic black, 8.4% Asian /pacific islander. 62% of women admitted to ICU and 78.3% who died had pre-existing conditions. Asthma was most common underlying condition in those who died (43.5%). The majority of those in ICU were treated >4 days after symptoms appeared. 57% receiving late treatment were admitted to ICU with 12- fold increase of mechanical ventilation and 54 times more likely to die than those with early treatment. 3rd trimester symptoms onset accounted for high proportion of severe illness (49%) and 64% of deaths.
Critical illness with AH1N1v influenza in pregnancy: a comparison of two population based cohorts.	2010	Knight et al. UK	British Journal of Obstetrics and Gynaecology	Population based comparative study UK n= 51 pregnant women admitted to ICU Australia & NZ n=64 pregnant women admitted to ICU	Australia & NZ incidence: 6.8/10000 maternities. UK incidence: 2.6/10000 maternities Australian& NZ women more likely to be indigenous, more likely to have pre-existing medical condition and co-existing illness than UK women. UK women more likely to be in third trimester on admission and more likely to have received antiviral medication prior to admission. No statistical differences in MMR or PMR.
Critical illness due to 2009 A/H1N1 influenza in pregnant and postpartum women: population based cohort study.	2010	Australian and New Zealand Intensive Care (ANZIC) Influenza Investigators and Australasian Maternity	British Medical Journal	Population based cohort study n= 64	Relative risk for pregnant and postpartum women being admitted to ICU with 2009 H1N1 was 7.4. 26 women were discharged from intensive care while still pregnant. Australian Aboriginal and Torres Strait women more likely to be admitted to ICU than non-indigenous women.

		Outcomes Surveillance System (AMOSS). Australia			36 women (56%) had co-existing disease including 21 woman (33%) with asthma. 44 women required mechanical ventilation. 9 women were treated with ECMO. 14 women birthed during their ICU admission, 13 by emergency caesarean section. Overall C/S rate 75%. 7 women died from 2009. 4 still births. No woman had been immunised for seasonal influenza.
Outcomes for pregnant women infected with the influenza A (H1N1) virus during the 2009 pandemic in Porto Alegre, Brazil.	2010	Jimenez et al. Brazil	International Journal of Gynaecology and Obstetrics.	Cross sectional study n=65 pregnant: 57 women, pregnant women requiring ICU admission: 8	4 of the 8 ICU admissions required mechanical ventilation No association between need for ICU and pregnancy duration and comorbidity. Antiviral treatment was initiated promptly in >80% of patients Women of advanced pregnancy or with comorbidity were not at increased risk of ICU admission Postpartum women not discussed 8 newborns required NICU admission mostly for prematurity No maternal or neonatal deaths.
Severe 2009 A/H1N1v influenza in pregnant women in Spain	2011	Maravi-Poma et al. Spain	Critical Care Medicine	Prospective observational study 50pregnant women compared with 184 non-pregnant women of childbearing age	Only women with confirmed H1N1 admitted to ICU were included ICU mortality rate not statistically different between the two groups Pregnant women presented with less comorbidities. Primary viral pneumonia was independently associated with pregnancy. Coinfection was more common in non-pregnant women. Invasive mechanical ventilation used in 73% pregnant women vs 59% non-pregnant women Corticosteriods were used in 82% of pregnant women for fetal lung maturation.
French experience of 2009 A/H1N1v influenza in pregnant women	2010	Dubar et al. France	PLoS ONE	Prospective observational study	27/40 in ICU in third trimester of pregnancy Co-existing disease in 58% of ICU cohort. Asthma and obesity most frequent co-morbidity

				315 pregnant or postnatal women ICU admission: 40	across entire cohort. 95% admitted to ICU due to respiratory failure. 50% required mechanical ventilation for a median of 13 days. Median length of ICU stay was 10 days Most women in the ICU group gave birth by caesarean section for indicators directly related to influenza at median gestational age of 33 weeks. 3 maternal deaths
2009 Pandemic influenza A(H1N1) in pregnant women requiring intensive care – New York City, 2009	2010	Fine et al. USA	Morbidity and mortality weekly report	Prospective case series Pregnant women n=17	Median age on admission to ICU: 23 years Median gestational age on admission to ICU: 34 weeks, 11 women were in third trimester of pregnancy Median length of hospital admission: 12 days 5 women developed ARDS 9 women gave birth during hospitalisation, 4 by emergency Caesarean section Eight live born infants; six admitted to NICU Vaccine status of most women was unknown 2 maternal deaths
Maternal and infant outcomes among severely ill pregnant and postpartum women with 2009 pandemic influenza A (H1N1)	2011	Newsome et al. USA	Morbidity and mortality weekly report.	Population based study n= 347 women ICU admission: 272 Maternal deaths: 75	Women who survived received antiviral treatment sooner than those who died. 49.8% had underlying disease 88% livebirths; 7% spontaneous abortions: 4% fetal deaths 69.4% of livebirths required admission to NICU

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Title of Article	Year of Publication	Author/s and origin	Source	Nature of research: methods	Summary of findings
Maternal critical care: what can we learn from the patient experience? A qualitative study.	2015	Hinton, L., Locock, L. & Knight, M. UK	British Medical Journal	Qualitative: Thematic analysis of interviews n = 18 women n = 9 partners	Three themes were identified; Being in critical care: onset of illness rapid and unexpected. Time was required to understand what had happened. Being a new mother in critical care: separation from baby. Establishing breastfeeding can be difficult Transfer out of critical care: coping with feeling weak and struggling to care for self and baby.
Pregnancy related ICU admissions in France: trends in rate and severity, 2006-2009.	2015	Chantry, A., Deneux-Tharaux, C., Bonnet, M. & Bouvier-Colle, M. France	Critical Care Medicine	Population based study. n = 11,824 women	63% of ICU admissions were during the postpartum period. Caesarean section rate: 58% Maternal mortality rate: 1.3% Proportion of women >35 years significantly increased along with severity and ICU length of stay. Amniotic fluid embolism had longest ICU stay. Evaluates the need for high dependency units (HDU) to more effectively use available resources to determine that HDU may be a viable option in the quest to manage the risk-benefits balance between adequate treatment and available resources.
The relationship between severe maternal morbidity and psychological health symptoms at 6-8 weeks postpartum: a prospective cohort study in one English maternity unit.	2014	Furuta, M., Sandall, J. Cooper, D. & Bick, D. UK	BMC Pregnancy and Childbirth	Cohort study n = 1824 women	This study aims to assess the relationship between severe maternal morbidity (SMM) and postnatal psychological health with a focus on PTSD symptoms at the end of the postnatal period. There was a direct relationship found between SMM and PTSD at 6-8 weeks postpartum. No evidence that place of birth mediated the relationship between SMM and PTSD symptoms.

					Higher level of perceived control during labour and birth may reduce the effect of SMM on PTSD. Organisation of care may influence the effect of SMM.
Women's perceptions and experiences of severe maternal morbidity **–** a synthesis of qualitative studies using an ethnographic approach.	2014	Furuta,M., Sandall, J. & Bick, D. UK	Midwifery	Literature review of qualitative studies n =12	This study aims to synthesize the literature related to severe maternal morbidity occurring in high and upper middle income countries. More than half of the studies described explore specific causes of SMM. The remaining studies explored the women's physical experiences. All studies explored the women's feelings and emotions at the time of their severe complications Three main themes were identified: Experiencing the severe event, the immediate reaction to the event and the aftermath of the event. The quality of care received by women during their experience impacted on their perceptions of their experience.
Epidemiology of obstetric related ICU admissions in Maryland: 1999-2008	2013	Wanderer et al. USA	Critical Care Medicine	Population based study n=2,927 women	Main reasons for admission were obstetric related hypertensive disease, haemorrhage, cardiac disease, infection Maternal mortality: 1.8% Infection and trauma are identified as an increasing cause of admission. Respiratory failure is a common complication Admission thresholds vary by facility size, smaller units have a lower threshold.

Maternal and neonatal separation and mortality associated with concurrent admissions to intensive care units.	2012	Ray, J., Urquia, M., Berger, H. & Vermeulen, M. Canada	Canadian Medical Association Journal	Population based study. n= 1,023,978 singleton live births	This study explored the outcomes of concurrent ICU admission of mothers (ICU) and babies (NICU). Women were older, more likely to be nulliparous, have lower socio-economic status, be drug dependent and have co-morbidities than those without concurrent admission. Mothers and babies with concurrent admission had the highest rates of mechanical ventilation when compared to other groups. Caesarean section rate: 78% Perinatal mortality was highest in the concurrent admission group (18/1000 births). Mother-infant separation highest due to interfacility transfer. Further research required is identified to include impact on maternal -infant bonding, family, maternal wellbeing, infant development and partner.
Obstetric admission to an integrate general intensive care unit in a quaternary maternity facility	2011	Crozier, T. & Wallace E. Australia	Australian and New Zealand Journal of Obstetrics and Gynaecology	Case series review n= 8151 births	Review of admissions to ICU over a 2 year period ICU admissions = 60 women 0.7% of ICU admissions and 0.4% of booked women Antenatal = 14, postnatal = 46 women Mean gestational age at admission or birth 34.5 weeks Median LOS in ICU = 35 hours Main reasons for admission haemorrhage, hypertensive disorder, pre-existing cardiac disease. No women died.

Chapter 3 Theoretical Framework and design

3.1 Introduction

The design of any research study is influenced by both the theoretical and practical considerations of the topic to be researched and the research questions to be answered (McDonnell, 2000). In this study, theoretical considerations were driven by the practical considerations of exploring the human condition of giving birth and becoming a mother when there were severe maternal complications experienced by the woman. Specifically, the woman would require the highest level of care within the Australian health care system, admission to the Intensive Care Unit. The complex and sensitive nature of this event required the researcher to apply a methodological framework that would capture the women's stories.

This chapter outlines the theoretical framework and methodology applied to this study. Pragmatism will be described as the overarching philosophical framework. Discussion will include a description of how pragmatism is applied to this study. The application of a theoretical lens of critical social science will be addressed. This lens will be focused through the application of woman-centred care throughout the study. The selection of case study methodology using multiple methods of data collection will be justified to demonstrate the validity of this study.

3.2 Theoretical Framework: Pragmatism

The theoretical framework adopted for this research is pragmatism. Pragmatism links theory and praxis enabling exploration of research questions by providing methodology to draw on many ideas

with a focus on the consequences of the research (Denzin & Lincoln, 2005; Stewart, 2014). In this study, praxis is applied as a way to evaluate the outcomes of theoretical explanations from real life clinical practice (Neuman, 2006). This framework enabled this researcher to recognize there is continual interaction between the women and their environment and to explore the outcomes of their experience. Thus, pragmatism is a viable mid-ground position where humanist concerns can be addressed and proper attention paid to science and scientific method (Schwartz, 2012). Creswell and Clark (2011) describe this as a 'what works' approach where objective and subjective knowledge are valued so that solutions are found by working backwards and forwards between the specific results and their implications. The research is an active and iterative process of finding actionable knowledge of direct practical value through the combination of reflection and action (Tashakkori & Teddlie, 2010).

This study is about the experience of women's journey through birth to motherhood within the specific context of severe maternal complications requiring admission and care in the intensive care unit (ICU). Throughout history, midwives have supported women on this journey. A discrete body of knowledge and skill, handed down from generation to generation, forms the practice of midwifery. Central to the philosophy of midwifery is recognition that each woman's past, present, and future shapes her pathway from womanhood to motherhood (Page, 2003). Midwifery knowledge is gained through interaction with the woman and her family over time, and through physical care (Fahy, Foureur, & Hastie, 2008). The pragmatic approach to attain and modify knowledge that informs the consequences of this knowledge sits comfortably with the philosophy of midwifery where the woman is considered a whole and complex being, with multiple experiences influencing the way in which she lives in her world. While working with women, this midwife researcher recognises each woman as a unique person, a complex map of intersecting similarities

and differences influenced by the physical, emotional, social, spiritual aspects and discourses of her life (Fahy et al., 2008; Pairman et al., 2015). This epistemology was significant to this study as the women recruited to the study expressed it was important to them that the researcher was a midwife.

There is tension between the philosophical descriptions of pragmatism by its founding fathers, James and Pierce. The concept of pragmatism was popularized by William James who argued that pragmatism is a theory of the nature of ideas and truth and a theory about reality (Schwartz, 2012) while other theorists describe pragmatism as the inseparable connection between rational cognition and rational purpose (Peirce, 1905) . However, James argues that when rationalism is pursued too robustly, it ends in untenable idealism and when empiricism is pursued too robustly it results in untenable materialism. In real life, it is impossible to extricate the two sides from each other, as there are usually more than two approaches worth considering (Schwartz, 2012).

When thinking about philosophy, one should begin by doubting everything (Peirce, 1905). Ideas become true in that they help make sense of the relationship between different parts of the experience and enable movement from anyone part of the experience to another (Dewey, 1908). However, truth has an ambiguous definition and could mean discovering the true meaning of something or, discovering the impact of an idea. As humans are creatures of meaning with experiences and responses enmeshed and mediated by the events that affect them (Dewey, 1908), human beliefs grow and change in response to what is going on around them and thinking occurs when the usual ways of responding are restricted or there is no habit available to provide a response (Schwartz, 2012). If belief is a habit of mind (Dewey, 1908), it follows then that thinking is the process of deliberate problem solving when the problem does not sit comfortably any longer. Deliberation occurs and empirical meaning changes in response to ongoing inquiry (Schwartz,

2012). With accepted beliefs forming the background of pragmatic inquiry, pragmatism is aimed at finding the truth.

3.3 Theoretical Lens: critical social science

The pragmatic maxim, as applied to this research, seeks to explore the reality of the woman's experience as she becomes a mother within a specific context. The use of pragmatism as the theoretical framework for this study provides the mechanism to use critical social science with a woman centred focus to explore this phenomenon.

The purpose of critical social science is to empower people, uncover myths, reveal hidden truths and help people change the world for themselves (Neuman, 2006). Drawing on the concepts of critical theory where researchers seek to understand how power and oppression shape everyday life and human experience, the focus of social science research is on improvement of the human condition (Denzin & Lincoln, 2005). The relationship between the individual and their contexts is central to the investigation, providing a connection that shapes the identities of human beings and the nature of the complexities of their social fabric (Denzin & Lincoln, 2005). Thus, critical social science is action orientated, aiming to integrate theory and practice in a way that enables awareness, exploration of contradictions of belief and the desire to change them (Polit & Beck, 2008). The idea that the researcher is an objective and disinterested inquirer is rejected. The ontological importance of relationships that alter the basic foundations of the research act and knowledge production process is recognized within a framework where this research midwife aimed to maintain independence from those being researched (Polit & Beck, 2008).

With an emphasis on multiple perspectives, the research is never static, always evolving, providing compelling insights (Denzin & Lincoln, 2005) into the human condition and its environment. Thus, the focus of contextualizing the health of the women in this study to attain better understanding of their experiences is supported by application of critical social science to the study.

Woman centred care is provided in a cultural context where women trust, feel safe and are empowered. These concepts form the central tenet of midwifery (Berg, Asta Ólafsdóttir, & Lundgren, 2012). The midwife responds to the woman's needs using grounded and embodied knowledge. This knowledge is theoretical and experiential. The midwife uses her/his knowledge to provide care as a balancing act, where an environment is created to let nature take its course by promoting normality across the continuum of care, including when abnormal events occur (Berg et al., 2012). This midwife researcher views pregnancy, birth and the early weeks after birth to be profoundly significant: as a transformative time when the woman becomes a mother. This is a time when sensitive, effective care affects not only the physical health of the woman, but also her sense of self and competence as a mother as she makes sense of her experience (Fahy et al., 2008). With a focus of woman centred care, this midwife researcher places herself as ontological architect (Fahy et al., 2008) maintaining the stance that the conscious and unconscious perception of the environment has a powerful impact on the physical, emotional and spiritual woman as she becomes a mother.

3.4 Research Design: Case study methodology

Methodology determines how the researcher thinks about the study, makes decisions about the study and positions themselves to engage with the components of the study. The choice of methodology is

determined by the research question and is strongly linked to the desired outcome of a study (Mills & Birks, 2014). The anticipated outcome of this study is to describe the case of the impact and outcomes of an ICU admission on the general health and wellbeing of women during the first six weeks after giving birth.

This researcher contends that every woman who gives birth, journeys along a transformative pathway to mothering the child who was born to her. While each woman's birth experience and transition to motherhood is unique to her, the pathway she travels is universal. The pathway includes recovery from birth which includes physical, psychological, emotional and spiritual adaptations to her being, developing a relationship with her new baby and making adjustment to the way in which she lives in her world. As this experience is a highly contextualised, complex life experience and, different for each woman, this study required a methodology that would remain flexible so the research questions could be answered (Rosenberg & Yates, 2007). Case study methodology was chosen to explore and gain understanding of these real life events (Yin, 2014).

Case study methodology has its origins in sociology and anthropology (Anthony & Jack, 2009; Creswell, 2013) emerging during the early 20th century when lengthy observations and involvement in the field of study occurred to explore remote cultures. As a methodology, case study has waned and been reborn as the tradition of survey analysis and generalisation of research results emerged as a focus of research outcomes. While some have challenged that case study is a data collection method that could not generalise the results, others describe case study to be a complete methodology (Creswell, 2013). The goal of case study research is to describe the case within its real life context and setting so that existing knowledge and understanding of the human condition will be

extended (Stake, 1978; Stewart, 2014; Zucker, 2001). Case study methodology enables the researcher to explore contextual

knowledge in relation to the case and enables interpretation of complex and interrelated phenomena to answer the research questions (Luck, Jackson, & Usher, 2006). For women transitioning to motherhood from their previous life, the experience is real and complex regardless of whether this is their first baby or they already have children. As each new life born into a family has effects on the family that are as different as each birth itself, case study methodology is a viable method of exploring this experience.

Yin (2014), a key writer of case study methodology and best known of the modern authors (Creswell, 2013; McGloin, 2008; Platt, 1992a), has refined the definition of case study to describe the methodology to be a strategy that can be applied to meet the circumstances and the research problem rather than being married to an ideological commitment irrespective of the circumstances of the research. Yin (2014) provides a two-part definition of case study. The first part of his definition describes the scope of a case study with the second part describing the features of a case study. The scope of a case study is defined to be an empirical inquiry that investigates real life phenomena in depth and within real world context when the boundaries between the phenomenon and context maybe blurred (Yin, 2014).The second part of Yin's definition deals with the features of a case study. He describes these features to include a technically distinctive situation where there are many more variables than data points. These are analysed to become one result. The variables are explored through multiple sources of evidence, gathered, analysed and informed by predetermined theoretical propositions. A number of authors have interpreted this definition to describe the methodology as an intensive study of an individual unit of interest that provides an in depth picture

of a person, organisation or situation (Rosenberg & Yates, 2007; Stewart, 2014) to obtain a wealth of descriptive information

(Brophy, 2008; Polit & Beck, 2008). Other authors have interpreted case study methodology to encompass a wide range of methods, focussing on a small number of detailed observations, applied when the phenomenon is highly contextualised with multiple variables unsuitable for control (Creswell, 2013; Rosenberg & Yates, 2007). Described as providing a bridge between paradigms, the methods used to explore the variables of the case may be quantitative and qualitative including interviews, questionnaires, observation, audio visual material, reports and any other source of information that describes the human experience through the generation of narrative, textual and numerical data (Creswell, 2013; Luck et al., 2006; Stewart, 2014).

However, there is tension arising from differing perspectives of case study methodology between the two most prominent writers, Yin and Stake (Creswell, 2013). While Yin defines case study to be a methodological process of empirical inquiry, Stake focuses on the case as the defining characteristic. Stake argues that while themes and hypotheses may be important, they remain subordinate to the understanding of the case (Anthony & Jack, 2009; Stake, 1978). This tension is evident in their description of the typology of case study.

Stake (2005) describes case study typology to be intrinsic, instrumental or collective. An intrinsic case study is one where the researcher wants better understanding of the particular case, that is, the researcher has an intrinsic interest in the ordinariness of the case. While an instrumental case is one where the researcher seeks to gain insight into deeper issues associated with or underlying the case. In this form, the case study is of secondary interest (Stake, 2005). Finally, a collective case study is

described by Stake (2005) as one that explores multiple cases jointly to investigate a phenomenon. Within Stake's description of his typologies, the focus of the methodology is the case.

Yin (2014) also describes case study in three typologies namely descriptive, explanatory and exploratory. Yin (2014) outlines the purpose of a descriptive case study is to describe the phenomenon, while an explanatory case study seeks to explain how or why a condition came to be and, an exploratory case study identifies research questions for subsequent research. Even though Yin and Stake differ in their thinking about case study as a methodology, the key features of case study are agreed in that the process is scientific and there is professional application of the methodology in the practice setting (McGloin, 2008). This study is conducted as a descriptive case study where the aim is to describe the experience of women with severe maternal complications during pregnancy or birth.

Nursing and midwifery are practice based professions focussed on providing care to the holistic person as a metaparadigm (Gangeness & Yurkovich, 2006). Within this metaparadigm, case study methodology is able to emphasise the participants' context and engage them in ways that other methodologies are unable to (Sharp, 1998). The use of cases and case histories, where materials may be manipulated to demonstrate a point, is common in the teaching of nursing and midwifery practice and in the review of clinical care throughout the health professions. Thus, the terms "case" and "case histories" may be confused with case study methodology. However, in case study methodology, systematic processes must be in place to report all evidence fairly and a chain of evidence maintained (Brophy, 2008; Luck et al., 2006; McGloin, 2008; Yin, 2014).

Case study methodology enables an intensive focus on the individual or small groups. The ability of case study methodology to address the broader scientific tests of validity, reliability and

generalisability has been viewed with scepticism as a research methodology (Brophy, 2008; Stewart, 2014; Yin, 2014). However, generalisation based on statistical inference where the focus is on the behaviour of aggregate and the individual is reduced to a sequence of responses to a questionnaire or a formal set of attributes is limited in social research where it is important to explain the relationship between variables (Sharp, 1998). Case study methodology enables each case to be formed through analysis of multiple methods of data collection including observation, interviews and surveys or questionnaires (Harper, 1992). Thus, the responsibility of the researcher is to demonstrate that the sample is representative of the population and the target population has essential features in common with the sample (Ragin, 1992; Sharp, 1998).

Platt (1992) argues that one case bringing new knowledge and understanding about the human state is proportionally as vital as large-scale studies. Yin (2014) supports this stance comparing case study research to a single experiment where the outcomes are generalizable to the theoretical question rather than the broader population. As in experiments, rigor through application of systematic procedures throughout the case study research process preserves data quality enabling analytical generalisation and theory development through corroboration, modification, rejection or advancement of theoretical concepts identified in the design phase of the study (Brophy, 2008; Yin, 2014). Stake (1998, p. 4) takes a philosophical stand arguing that "the better generalisations are the more personal .., truth in the field of human affairs is better approximated by statements that are rich with the sense of human encounter … recognising that similarities of objects and issues in and out of context is both intuitive and empirical". Other authors address the criticisms contending that there is failure to acknowledge that both quantitative and qualitative research methods are analysed in interpretive and subjective ways that can be generalised to the case (Brophy, 2008). Credibility of

case study research is based on adherence to the methodology. This includes use of multiple sets of data, acknowledgement of theoretical support for the methodology and explicit

attention to rigor. Failure to report rigor undermines the methodological quality as well as credibility of the research (Anthony & Jack, 2009). While case study research is considered by some to be soft research (Yin, 2014), careful planning and foresight in design is required (McDonnell, 2000) to attain meticulous analysis of these data. It is this evidence base and professional application that provides the scientific credentials of case study (Zucker, 2001).

3.5 What is a case?

The term 'case' is widely used by many professions and in organisational spheres and contexts. Commonly, lawyers, health professionals, sociologists, governments, corporations and organisations use the term 'case' as part of their everyday language. For example, within the language of healthcare, a case may be related to a person's health, their condition or the person themselves; whereas in organisational management a case may refer to an employee or an event. This diversity of use has led to poor clarity about the definition of a case (Ragin, 1992). Within the paradigm of case study research, cases have causal processes and the purpose of a case is to demonstrate an argument about how general social forces take shape and produce results in specific settings (Sharp, 1998; Walton, 1992).

Ragin (1992) argues that the conversation about 'what a case is', has no beginning or end, comparing the question to 'What is a population?' or 'What is a variable?' Many authors have discussed 'What is a case?' using their own research as exemplars to reach a common theoretical ground. Authors agree

that cases may relate to 'the population' and to the concept of 'the variable'. It is also agreed that cases are fundamental to the conduct of social science (Ragin, 1992). While individual cases of case study research are not discussed within this chapter, the commonalities of the definitions used have been identified, synthesised and applied to this research.

A case is the main subject of the inquiry and may be simple or complex (Denzin & Lincoln, 2005). A case must be identifiable as a characteristic unit with a means of interpretation so that facts, concepts, reality and hypothesis are able to be related (Walton, 1992; Wievoka, 1992). The case draws its entity from the way it takes shape with all the elements of the phenomenon considered, enabling the researcher to see the bigger picture. Wievoka (1992) argues that an event or situation alone does not constitute a case. There must be something else that enables the researcher to see a larger phenomenon or to interpret the event or situation with a broader approach. Within the human condition, a case is unique to the person or group of persons who have experienced a similar event, activity or circumstance that can be described and analysed (Vaughan, 1992).

Cases should be chosen for particular purposes with the sample representative of the population (Platt, 1992b). As cases are selected based on typological distinction, the case is dependent on the integrity of the individual distinctions so the sum of the individual characteristics and the global characteristics of the case can be applied to the collective as a whole (Platt, 1992b; Vaughan, 1992). Thus, the sample should be identifiable as a group from society (Platt, 1992b).

While a case may consist of a single case or multiple cases, it is a unit of analysis bounded by time and place (Creswell, 2013) with the boundaries kept in focus throughout the inquiry (Stake, 1978).

Bounding the case is important as the boundaries of the case determine the scope of data collection and maintain the case within concrete parameters (Creswell, 2013; Yin, 2014). These boundaries form variables which highlight the realities and complexities of the case, creating patterns that identify the similarities of each individual unit that constitutes membership to the case (Vaughan, 1992). Through bounding the case, researchers seek out what is common and what is particular to the case, drawing attention to the ordinary experience (Denzin & Lincoln, 2005).

Abbott (1992) argues that the ontology of cases differs sharply in population, analytical and case narrative approaches. Population or analytical cases are constructed from the foundation that the case exists with clearly distinctive features, such as demographic variables, which can be added to the case and the case becomes the sum of those variables. Thus, the case is continuous, just as a line is made continuous by the joining of dots on a page. This analytical and deductive natural science model may not allow the most meaningful boundaries of the human condition or complexities of their social processes to be seen (Harper, 1992).

In contrast, a narrative approach is able to mix demographic, analytical and descriptive information in ways that a population or analytical model is unable to (Abbott, 1992). In the narrative case, the case is transformed by 'fuzzy' boundaries where there is perpetual dialogue with the environment of the case. Abbott (1992) contends that how the narrative of the case is constructed does not matter, as the purpose of the case is to tell the story in a fluid and powerful way. However, the events of the story need to be identified and arranged in plots that intersect so that the events being explored are in a loose causal order. While Abbott (1992) views intersecting plots as problematic, arguing that each event has many immediate antecedents and consequences, the use of pragmatism as a philosophical standpoint in this study enables the antecedents and the consequences to form the reality of the event.

As a case involves multiple elements, the coherency of a case is achieved by the convergence of unrelated factors of the experience under study, rather than from the theoretical tools used to analyse the case (Wievoka, 1992). As cases vary in size, complexity and function, they are analysed independently to maintain the uniqueness of each case. In multiple cases, the cases are able to be compared, identifying contrasts that demand re-interpretation and transformation of theoretical constructs leading to micro and macro understanding of the cases (Vaughan, 1992). The sequence of events is explored by studying the narratives across the cases to identify the commonalities of each case (Abbott, 1992). A real group is categorised when a portion of the individuals have a common characteristic and it is implied that this characteristic is present in other individuals in the same category (Ragin & Becker, 1992).

Ragin (1992) argues there are two key dichotomies in how cases are determined with the first being whether the case involves empirical units or theoretical constructs. If a case is seen to involve empirical units, the case is there to be found. As described above, the bounding of the case is integral to the research process and identifying the case, whereas, if a case is a theoretical construct, the case is shaped over the course of the research and is seen as the consequence of the research.

The second dichotomy identified by Ragin (1992) relates to the generality or specificity of the case categories. Specific cases emerge as a result of the research, defined by the findings of the research and existing only because of the research process, whereas, general cases are seen as real and bounded, existing prior to the research and external to the conduct of the research. These dichotomies have been cross-tabulated by Ragin and Becker (1992) as demonstrated in Table 3.1.

Table 3. 1 Conceptual map for answers to "What is a case"

Understanding of cases	Case conceptions	
	Specific	**General**
As empirical units	1. Cases are found	2. Cases are objects
As theoretical constructs	3. Cases are made	4. Cases are conventions

(Ragin & Becker, 1992)

3.6 Application of case study methodology to this study

The case formed by this study is bounded and real. The case is bounded by context of birth, health outcomes and complexity of care. The reality of the case is formed by the experience of the women who agreed to join the research as participants. This study describes one case formed from two units of study. The first unit of study is the outcomes of women. The outcomes are derived from empirical data collected from women who had experienced an admission to ICU for severe maternal complications and, from healthy women who gave birth to healthy babies in a continuity of midwifery care model. The second unit of the study is narrative data describing the impact of the experience of an admission to ICU on the women during pregnancy or birth. Analysis of data from both units of study is combined to form the case: Outcomes and impact of an ICU admission for severe maternal complications during pregnancy or birth.

3.7 Ethical considerations

Ethical approval to conduct the study was received from Townsville Human Research Ethics Committee and James Cook University Human Research Ethics Committee (HREC /11/QTHS/188: JCU H4613). Site-specific approval was received from The Townsville Hospital and Health Service (SSA/12/QTHS/102) and Cairns and Hinterland Health Service (SSA/14/QCH/114-LEAD170). As the study progressed, amendments were made to the study. These amendments included the addition of a comparison or control group to the study and the addition of The Cairns Hospital as an extra site for quantitative data collection. All amendments received institutional ethical approval.

The three primary ethical principles on which the standards for ethical conduct in research are based namely beneficence, respect for human dignity and justice (Polit & Beck, 2008), were at the forefront in the design and conduct of this study. The National Health and Medical Research Council (2007) identify that each human being is autonomous and has the right to decide if they wish to participate in research. The value of human autonomy was respected at all times during the course of the study and the guidelines outlined by the NHMRC (2007) for the conduct of human research adhered to at all times. Written consent was gained from all participants as a mechanism to ensure that participation in the study was voluntary, based on sufficient information about the research and the implications of the research (NHMRC, 2007). Women under the age of 18 were excluded from the study, as their capacity to understand what the research entailed could not be assured by the researcher.

Pregnant women were specifically identified as participants in this study. The wellbeing and care of the pregnant woman always took precedence over the research process (NHMRC, 2007). Women were offered the opportunity to have support persons of their choice with them during the recruitment and data collection phases. Women were also offered access to counselling and health education during the data collection phases.

Aboriginal and Torres Strait Island women were identified as likely to be co-incidentally recruited to the study. NHMRC (2007) describe that the cornerstone of an ethical research relationship with Aboriginal and Torres Strait Islander Peoples is respect for, and valuing of, cultural and language diversity. All Aboriginal and Torres Strait Island women were offered the support and presence of an Aboriginal and Torres Strait Island Health Worker during all phases of recruitment and data collection during the study. The role of the Aboriginal and Torres Strait Island Health Worker was to ensure that the discrete cultural diversity of the Aboriginal and Torres Strait Island women and their families was respected and to advise the researcher on cultural and social practices (NHMRC, 2007).

During the study, all data collected were stored in the locked office of the researcher. On completion of the study, all data will be collated, labelled with a marked date for destruction and stored securely in accordance with the NHMRC guidelines.

3.8 Chapter Summary

The theoretical framework of pragmatism has been described in this chapter. This researcher has argued that pragmatism is an appropriate philosophical position upon which this research can be undertaken. Critical social science applied through a woman centred care lens has been described as an appropriate worldview. Case study methodology has been argued to be the appropriate methodology to explore the case within a health care paradigm and to assist to find answers to the research questions. The theoretical features of a case have been described in detail and applied to this research. The ethical considerations of this research were described and dealt with through institutional processes and ethic approval which were described in the previous section of this chapter.

The following chapter describes the data collection tools and techniques used in this research with in-depth discussion of the methods used in the research.

Chapter 4 Methods

4.1 Introduction

This chapter describes the research design of this study and the methods used to collect and analyse data that enabled exploration of the outcomes and impact of an intensive care unit (ICU) admission during pregnancy or birth. A description of the research design and the methods chosen to conduct the research will open the discussion of this chapter. An overview of the multiple data collection methods employed in this study will precede detailed description of participant recruitment procedures. These data collection methods included a retrospective medical record review of admissions to the ICU. These demographic data are described to provide a background to this study.

Two participant groups provided prospective quantitative and qualitative data collected from women who agreed to participate in the study. The research tools used to collect the quantitative data set are then described with the validity and reliability of the tools used to collect the data.

A description of the semi-structured interview method used to collect the qualitative data of this study follows. The validity of semi-structured interview as the qualitative data collection method used in this study is addressed and thematic analysis as the method for this data analysis is described. The participants who were interviewed and provided the qualitative data for this study are introduced.

4.2 Study Design

As discussed in Chapter 3, the pragmatic paradigm focuses on the consequences of actions to identify the reality of the experiences being investigated. Thus, this study required epistemological and methodological flexibility to provide the mechanism to answer the research questions of this study by combining both deductive and inductive thinking (Creswell & Clark, 2011).

The case of this study is the impact and outcomes of an admission to ICU during pregnancy or birth. The research design is an embedded single case study during which qualitative and quantitative data was collected, analysed and interpreted in an integrated way (Creswell & Zang, 2009). The rationale for choosing a single case study was that the case is an extreme case with a major deviation from the normal pathway of healthcare within the maternity context of a specific health care setting (Yin, 2014). An embedded design enables the research to focus on the sub-units that form the case.

Two units of study are embedded within the case. Each unit of the study is composed of women who received care around the time of giving birth. Women who were admitted to the ICU during pregnancy or at birth formed one unit of study. The second unit of study is composed of healthy women who gave birth normally within a caseload model of midwifery care. These units are referred to as the ICU women group and the healthy women group throughout this thesis to personalise the discussion. All women received antenatal, labour or postnatal care from the same health service.

Multiple methods of data collection were used to enable the woman to tell her story. Quantitative and qualitative data allowed me, as the researcher, to explore the complexities of the topic and increase confidence in the validity of the results (Polit & Beck, 2008). Statistical analysis of the quantitative data collected enabled the outcomes of the experience to be described. Thematic analysis of qualitative data described the impact of the woman's experience on her life. The strengths and weaknesses of each data collection method and analysis enabled qualitative and quantitative data to complement each other to tell the story of the experiences of new mothers so that the case of the women admitted to ICU during pregnancy or birth could be formed (Creswell & Clarke, 2011). Figure 4.1 demonstrates the schematic study design.

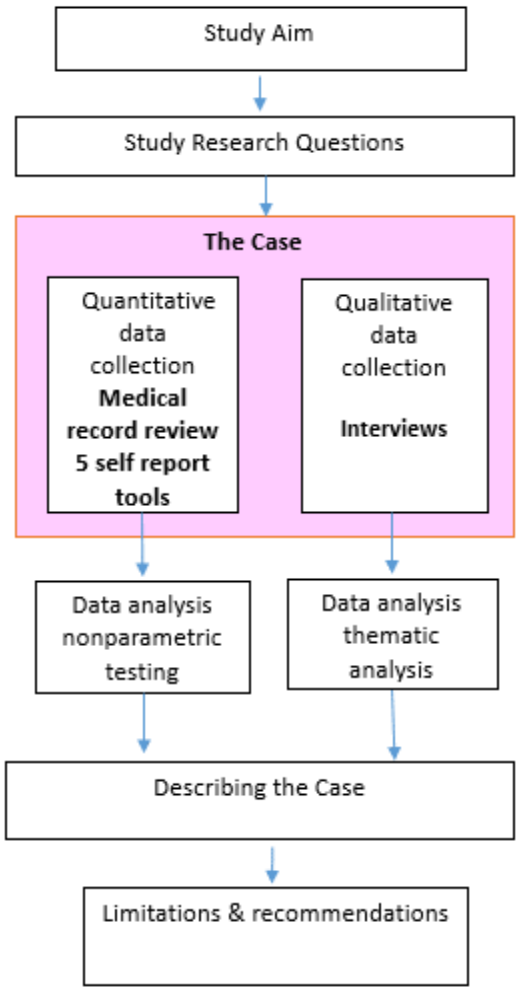

Figure 4. 1 Study Schematic Design

4.3 Characteristics of the study site

The study site was an ICU in a publicly funded regional tertiary hospital in North Queensland. This facility provided general intensive care for the people who live in a geographical area bounded by an area of Papua New Guinea in the north, the Northern Territory border in the west and to Rockhampton in the south. In 2015, the unit was resourced through an annual budget of over $18

million with a maximum capacity to care for up to twenty-one (21) ventilated patients at any one time. The patients were cared for by 129 nurses, 24 medical officers and five permanently appointed allied heath staff. Four nurses were also registered as midwives.

There were approximately 1300 admissions to the unit each year of whom 16% identify as Aboriginal or Torres Strait Islander origin. In 2015, the average length of stay for all patients was 67 hours. As a subset of the overall admissions, antenatal and postnatal women accounted for eighteen (18) admissions with a slightly shorter average length of stay at 58 hours (Queensland Health [QH], 2012).

The maternity unit at the study site provided primary and secondary care for pregnant and birthing women of the local area and tertiary care for the women of North Queensland. The tertiary service covered a geographical area from Mackay in the south, to Cape York in the north, and the Northern Territory border in the west. Maternity care was provided by 140 midwives and 25 medical officers. Twenty of the midwives were employed in caseload models of midwifery care including a low risk stand-alone birth centre and an all risk midwifery group practice. A tertiary level Neonatal Unit comprised of twenty (20) Neonatal Intensive Care Unit (NICU) cots and thirty (30) Special Care Nursery (SCN) cots provided newborn care support to the maternity service (QH, 2012).

There were approximately 2700 births within the maternity service each year, with approximately 500 women transferred or retrieved from primary or secondary health sites to the maternity service for pregnancy or birth care. Approximately thirty (30) percent of women received midwifery care

within the caseload models. The year on year caesarean section rate within the service was approximately thirty (30) percent. Pregnancy or birthing women admitted to ICU received lactation advice and midwifery care from a lactation consultant and a ward based midwife during their admission to ICU (QH, 2012).

4.4 Overview of data collection methods

4.4.1 Medical record review

A structured review was undertaken of the medical records of all maternity cases admitted to ICU over the period 1 January 2006 to 31 December 2013. The purpose of the medical record audit was to inform the study about the women who were admitted to the ICU during pregnancy or in the postnatal period at The Townsville Hospital. These data had not been previously analysed.

A maternity case was considered as any woman who was pregnant or had given birth within the previous six weeks at the time of admission. All medical records that met the criteria were included. One hundred and five (105) medical records were reviewed. The commencement date of 1 January 2006 was chosen as it marked the introduction of an electronic database in the ICU, which reduced the human error of manually collected and collated data. The end date of 31 December 2013 was the latest date validated data were available at the time of the data collection phase of the study.

4.4.2 Quantitative data

Prospective quantitative data were collected from all women recruited into the study through demographic information and five self-reporting questionnaires. This data was collected between December 2012 and May 2015. The self-report questionnaires included the Short Form 36 version 1(SF36) (Ware & Sherbourne, 1992), the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983), the Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987) and the Postnatal Bonding Questionnaire (PBQ) (Brockington, Fraser, & Wilson, 2006).

These data were collected from the ICU women at two time points. Initial data was collected from each of thirteen (13) women within 24 hours of their discharge from ICU and while the woman was still inpatient in the hospital ward. Follow-up data were collected from five (5) of these women at approximately six weeks after birth. This same data set was collected from forty (40) women in the healthy group at approximately six weeks after birth. The data collected from the healthy woman provided a comparative data set. Forty healthy women is representative of the annual caseload of one midwife providing continuity of midwifery care at the study site.

4.4.3 Qualitative data

A semi- structured interview was conducted with each of the five women from whom follow up quantitative data was collected. During the interview each of these women related her experience of her birth and recovery. The interview was conducted at approximately six weeks after the birth of her baby in conjunction with the quantitative data collection. The interview was conducted following completion of the self-report questionnaires. The researcher applied this process to assist the woman to focus on herself and reflect on her own health prior to her telling her story. This parallel approach ensured that the story of each woman was complete (Polit & Beck, 2008). The qualitative data clarifies concepts identified in the quantitative data and corroborates findings from statistical analysis (Creswell & Clark, 2011). In this parallel approach, quantitative results are illustrated using qualitative findings to enrich understanding of the findings of the research. The relationship between the qualitative and quantitative is demonstrated below in Figure 4.2.

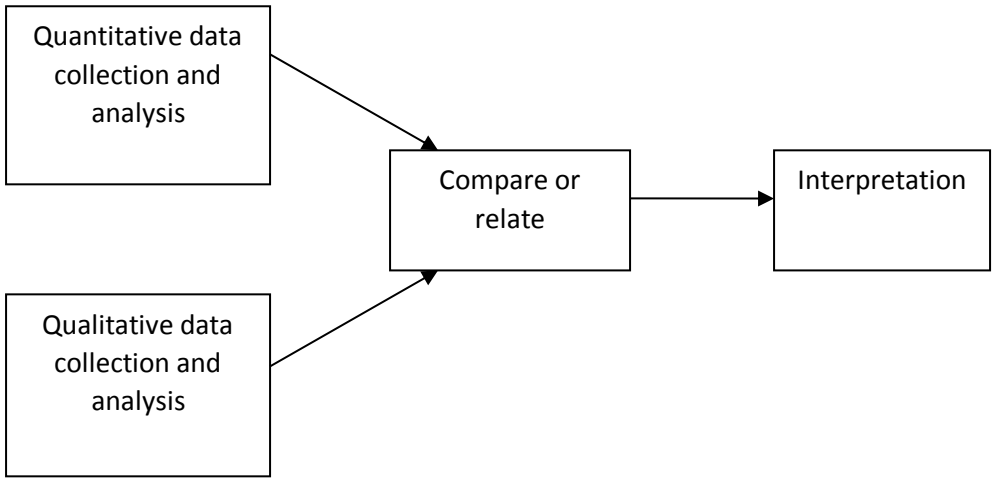

Figure 4. 2 Prototypical convergent parallel design

(Creswell & Clark, 2011. p.69)

4.5 Recruitment procedures

4.5.1 Intensive Care Unit group.

The recruitment of women to the ICU group required continuous and open communication pathways to be maintained between myself, as the researcher, and the research site throughout the recruitment phase of the study. I drew on existing professional relationships to maintain these lines of communication. The Maternity Unit Manager notified me when a woman who met the research criteria was admitted to the ICU. The notification would be via a telephone call, text message or email. Shortly after the woman was transferred from ICU to the maternity or general ward, the Maternity Unit Manager would notify me that the woman had been transferred to the ward. Within 24-hours of her transfer, I would introduce myself to the woman and provide the woman with an information sheet about the study. I would then seek consent from the woman to join the study prior to presenting the woman the booklet of self-report data collection tools. The woman completed the self-report demographic data and five self-report questionnaires while she was inpatient in the hospital. I remained present with the woman while the questionnaires were completed to clarify any points related to the questionnaires or the research process as required.

Participants were contacted via telephone at four weeks postpartum to arrange for follow up data collection. Additional telephone and electronic mail contact was attempted if there was no response to the initial telephone call. I collected follow up data from each woman at approximately six weeks after she had given birth, at a time and place that was convenient to the woman. In this phase of the data collection, women were asked to complete the same set of five self-report questionnaires used

in the initial data collection phase. As with the first phase of the data collection, I remained present with the woman during collection of this data. Following completion of the self-report questionnaires, the woman was invited to tell her story. If the woman consented to involvement in this phase of the study, I conducted a semi-structured interview. Each woman was invited to recount the events surrounding her intensive care unit admission from her perspective, recovery from birth and becoming a mother to this baby. The following questions guided the direction of the interview:

- Tell me about your intensive care unit admission?
- Describe what it was like for you?
- Tell me about your contact with your baby (if postnatal admission) during your ICU admission?
- Describe how your intensive care admission has influenced your experience of becoming a mother?
- Do you think your intensive care unit admission has influenced your relationship with your partner?
- How are you feeling now?

Each interview was digitally recorded and transcribed verbatim. Journal notes were made during the interviews. The journal notes recorded information about the setting, the woman's demeanour and comments about the researcher's thoughts and feelings at the time.

4.5.2 Healthy women group

The same level of open and continuous communication established during the recruitment of the women in the ICU women group was maintained between myself, as the researcher, and the research site throughout the recruitment of the healthy women to this study. Healthy women who had experienced a spontaneous vaginal birth were recruited through the Townsville Hospital Midwifery Group Practice and the Townsville Birth Centre. As the caseload midwives employed in these models of care maintain a therapeutic relationship with the women who give birth within these models of care for six weeks after birth, these midwives were integral to the recruitment process of the healthy women group. As with the ICU women group, I drew heavily on existing professional relationships with the caseload midwives and their managers to facilitate recruitment to this group.

The recruitment of women to this group commenced with the caseload midwife giving women who met the research criteria information about the project at their four-week postnatal visit. The caseload midwife provided the woman with an information leaflet and briefly outlined the project. If the woman indicated that she was interested in the project, the caseload midwife provided me with the woman's contact details via telephone or email. I then contacted the woman to discuss the project further and make an appointment for data collection if the woman wished to join the study. This appointment was arranged to occur at approximately six weeks after her birth at a time and place most convenient to the woman. Consent was gained prior to data collection. All women in the healthy group chose to invite me to their home for consent and data collection.

The woman completed the same set of demographic data and five self-report questionnaires as the women in the ICU group. I remained present with the woman while she completed the questionnaires clarifying any points related to the questionnaires or the research process as required during this time.

4.6 Detailed data collection methods

4.6.1 Chart Audit Procedures

Data were extracted from the Townsville Hospital (TTH) ICU admissions database. The TTH ICU admissions database uses the Australasian Outcomes Research Tool for Intensive Care (AORTIC) version 9.2.5 Copyright 1999 – Metafacts P/L. The Australian and New Zealand Intensive Care Society (ANZICS) as the data submission tool supply the database for the ANZICS Centre for Outcome and Resource Evaluation (CORE) group. ANZICS CORE administers the national Adult Patient Database (ANZICS APD). Data were collected on customised forms by the ICU Data Manager and entered into the database by a dedicated data manager. There was a dedicated field specifying pregnant or postpartum status, which was used as the filter for admissions to the ICU during the selected time period. The ICU Data Manager undertook the filtering of data. Extracted data were collated on an excel spreadsheet by the ICU Data Manager which was then sent to me via email. The TTH ICU database includes 9201 ICU admissions logged between 1 January 2006 and 31 December 2013 (Queensland Health [QH], 2012).

The medical records were retrieved through the normal institutional medical record request process for The Townsville Hospital. This process required me to complete a health service generated form listing the medical record number, first name and surname name of the required record and a room number to which the records would be delivered. I then sent this form via electronic mail to the medical records department. Medical records staff retrieved each record from its repository and delivered the records to a nominated room in the Maternity Ward. The records were batched in lots of less than ten records to ensure that the volume of records remained manageable.

I extracted data according to the approved study protocol by manually reviewing each medical record. Prior to review, I crosschecked each record against the data sheet prepared by the ICU Data Manager and against the medical record request form sent to the Medical Records Department. This was to ensure the medical record related to the correct person and episode of care. These data were entered into an excel spreadsheet at the time of the review by myself. Once the entire review of all the medical records that met the criteria had been completed, the excel spread sheet with the complete data set was sent, via electronic mail, to the senior Obstetric Registrar for validation. The Obstetric Registrar would contact me in person if there were any anomalies found. This part of the review process was undertaken prior to commencement of data entry into the selected software package. These data were coded and entered onto IBM SPSS version 22. Data collected included parity, maternal age, ethnic origin, point of admission, gestational age on admission if antenatal point of admission, admission source, birth method, gestational age at birth, length of stay in ICU, ICU admission diagnosis, monitoring and interventions, intention to breast feed, actual breastfeeding, and ICU discharge unit.

One hundred and five medical records were reviewed. From the output data, 41 (39%) women were primiparous and 59 (56%) women were multiparous with no parity recorded for five women. Eighty-three (79%) of women were admitted during the postnatal period with 19 (18%) women admitted during the antenatal period. Table 4.1 describes the ethnic background of the women.

Table 4. 1 Chart audit ethnic background.

Ethnicity	n = 105
Caucasian	69 (68%)
Aboriginal	24 (23%)
Torres Strait Islander	4 (4%)
Other	3 (3%)

The mean maternal age was 29 years (range 16-43 years, SD =7). The mean gestational age at birth was 32.3 weeks (range 5-40 weeks, SD =5.5). The women admitted to ICU during the antenatal period were between 5 and 36 weeks gestation (mean 25 weeks, SD =7.8).

The source of admission to The Townsville Hospital is shown in Table 4.2.

Table 4. 2 Source of admission of women to ICU.

Source of Admission	n = 105
The Townsville Hospital	45 (43%)
Regional Hospital	22 (21%)
Rural Hospital	28 (27%)
Remote health Service	7 (7%)
Not recorded	3 (2%)

There were many reasons why women required admission to ICU including maternity and non-maternity morbidities. The most common reasons are identified and the least common grouped together as either pregnancy related or other. The reasons for admission are described in Table 4.3.

Table 4. 3 Reasons for admission to ICU

Reasons for admission to ICU	n = 105
Gestational Hypertensive disorders	51 (49%)
Antepartum haemorrhage	12 (11%)
Postpartum haemorrhage	4 (3.8%)
Non-puerperal sepsis	13 (12%)
Pre-existing cardiac disease	5 (4.8%)
Other pregnancy related disorder	4 (3.8%)
Other – general	13 (12.4%)

Women in ICU received a range of monitoring and interventions while inpatient in the ICU. These are described in Table 4.4.

Table 4. 4 Monitoring and interventions in the ICU.

Monitoring and Interventions	n = 105
Supplemental Oxygen only	44 (42%)
Ventilator support	34 (32%)
Magnesium sulphate with other interventions	28 (27%)

Magnesium sulphate administration only	19 (18%)
Central venous access and monitoring	33 (31%)
Inotrope administration	5 (5%)

Caesarean section was the birth method for 82 (78%) women, with nine (8.6%) women experiencing a spontaneous vaginal birth and three (3%) women experiencing an instrumental birth.

The mean length of stay in ICU was 49 hours (range 3-248 hours, SD=51.2). On discharge from ICU, 74 (70%) women were transferred to the maternity ward, 18 (17%) to general wards within The Townsville Hospital, 12 (13%) women were transferred to Birth Suite for high dependency care and one woman was transferred to another hospital. No women died.

The Townsville Hospital and Health Service is accredited by the World Health Organisation as 'Baby Friendly'(World Health Organisation, 2009). This accreditation recognises the commitment of the organisation to support mothers to breastfeed. Thus, successful initiation of breastfeeding and sustained breastfeeding are key performance indicators for the health service. All women attending the health service are asked about their intended method of feeding during their antenatal care. The woman's decision in relation to her preferred feeding method is recorded in her antenatal record. If the mother has chosen to breastfeed, the time of the first breastfeed is documented in the medical record of both mother and baby. Breastfeeding and intention to breastfeed is described in Table 4.5.

Table 4. 5 Intention to breastfeed and actual breastfeeding in the ICU

Breastfeeding	n = 105
Intention to breastfeed	78 (74%)
Actual breastfeed	78 (74%)
No breastfeeding	16 (15%)
Feeding choice not indicated	17 (16%)

4.7 ICU women group description

Thirteen women were recruited into the ICU group via a purposeful sampling method between December 2012 and June 2015 from the Townsville Hospital Intensive Care Unit. The women were eligible to participate if they were over the age of 18 years, admitted to the intensive care unit while pregnant or in the postnatal period and had given birth to a live born baby. One woman was admitted to the ICU during the antenatal period. The remaining twelve women were admitted to ICU after they had given birth. Eight women were of Caucasian origin, two women identified as Aboriginal, one woman identified as Aboriginal and Torres Strait Islander and two women did not indicate their ethnicity.

The following tables describe the women (Table 4.6), the reason for their admission to the ICU (Table 4.7) and the outcome of their pregnancy (Table 4.8).

Table 4. 6 ICU women description

	Mean	Standard Deviation
Maternal age	31 years	7.014
Gestation at birth	36 weeks	3.811
Days in ICU	2 days	1.188

Table 4. 7 Reason for admission to ICU

Reason	n = 13
Obstetric haemorrhage	7 (54%)
Pre-eclampsia	2 (15%)
Placenta praevia	1 (7%)
Influenza	1 (7%)
Non-puerperal sepsis	1 (7%)
Other	1 (7%)

Table 4. 8 Pregnancy outcome: Birth Method

Birth method	n = 13
Caesarean Section	10 (77%)
Assisted vaginal birth	1 (7%)
Spontaneous vaginal birth	1 (7%)
Antenatal admission	1 (7%)

4.8 Healthy women group description

A group of healthy women, who received care in the same health service as the ICU group, was recruited to the study as a comparative or control group for the quantitative data analysis. Forty women were recruited by purposeful sampling to the healthy group between June 2014 and April 2015. These women had received their pregnancy and birth care from midwives working in The Townsville Hospital midwifery models of care of either the Birth Centre or Midwifery Group Practice. The forty women recruited into this study replicates the typical midwifery caseload of healthy women in Australia (Homer, Brodie, & Leap, 2008). Table 4.9 describes the healthy women.

The women were eligible to participate in the study if they resided in the Townsville local area, were over the age of 18 years, were of normal obstetric risk and had experienced a spontaneous vaginal birth of a live born baby, and had not required admission to the intensive care unit during pregnancy or in the postnatal period. In this group, thirty three (83%) women were of Caucasian

origin, three women (7%) identified as Aboriginal and four (10%) women did not indicate their ethnicity.

Table 4. 9 Healthy women group description

	Mean	Standard Deviation
Maternal age	29 years	4.526
Length of gestation at birth	40 weeks	0.893

4.9 Materials

4.9.1 Quantitative Data

Demographic data were collected to provide insight into the study group. Information collected related to the age, parity, model of care during the pregnancy continuum, birth method, and morbidity. Information related to each woman's baby was also collected. This information included detail of gestational age at birth, birth weight and admission to the Neonatal Unit for care.

The healthy women completed the same five questionnaires as with the ICU women. The questionnaires were presented to the healthy women in the same format as the ICU women. As with the ICU women, I remained present with the healthy women while they completed the questionnaires, providing clarification as required. The following discussion provides a description of each self-report questionnaire used in this study.

Medical Outcomes Study Short Form 36

The Medical Outcomes Short Form 36 version 1 (SF-36) is a multi-purpose health survey of 36 questions to measure quality of life outcomes in a vast range of clinical conditions. The use of standardised tools to measure general health not specific to age, disease or treatments is an efficient way to gain information about health status of populations (Ware & Sherbourne, 1992). Functional health and wellbeing scores are calculated for eight subscale domains including physical functioning (10 items), role limitations as a result of physical health (4 items), bodily pain (2 items), general health perceptions (5 items), vitality (4 items), social functioning (2 items), role limitations because of emotional health (3 items) and general mental health (5 items) (Ware & Sherbourne, 1992).

Participants were asked to respond to each of the questions using a 3, 5 or 6 point Likert scale or a yes/no response. The participant marked a response closest to how they were feeling. The scores for each sub-scale were combined to determine a score for that subscale. Ware and Sherbourne (1992) define the meaning of low and high scores in each subscale to guide the interpretation of each subscale. For example, a low score in the subscale of physical functioning means that the participant is significantly limited in performing all physical activities while a high score means that the participant performs all types of physical activities including the most vigorous without limitations because of their health.

The subscales of physical functioning, role limitations as a result of physical health, bodily pain, and general health perceptions are combined to score the overall dimension of physical health. The subscales of vitality, social functioning, role limitations because of emotional problems and general mental health form the overall score for the dimension of mental health. The dimensions of physical health and mental health combined to describe the overall general health score of the participant. Total scores range from 0-100 with higher scores indicating better health status (Jomeen & Martin, 2005).

The SF-36 can be administered in five to ten minutes with a high degree of acceptability and to the participants as a self-administered, computer administered, or interviewer administered tool with a high degree of quality (Ware, 2000).

Hospital Anxiety and Depression Scale

The Hospital Anxiety and Depression Scale (HADS) was developed to identify anxiety and depression disorders among patients in non-psychiatric hospitals (Bjelland, Dahl, Haug, & Neckelmann, 2002). The tool successfully separate anxiety and depression in the general population through division of the scale into an anxiety subscale and a depression subscale with each comprised of seven items rated on a four point Likert scale (0-3) (Zigmond & Snaith, 1983). The participant is asked to give immediate responses about how they are currently feeling and are dissuaded from thinking too long about their answers (Zigmond & Snaith, 1983). The response to each item is given a standardized score. The scores are then summed. The HADS has similar sensitivity and specificity to the longer General Health Questionnaire (Bjelland et al., 2002) and medium to strong correlation

to other questionnaires such as the Beck's Depression Inventory (Bjelland et al., 2002). This tool takes two to five minutes to complete.

Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI) is a 19 item self-report tool used to assess sleep quality and disturbances that may affect the quality of sleep quality. The PSQI is validated for use in a variety of clinical populations (Carpenter & Andrykowski, 1998). The participant is asked to assess their patterns of sleep, sleep quality and sleep disturbances retrospectively over the previous one-month time interval using a four point Likert scale (0-3). The participant is also asked to provide other quantified information such as the time of going to bed, how long to go to sleep, how many hours slept and time of getting out of bed. The responses are given normative scores to determine seven component scores identified as sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleeping medications, and daytime dysfunction. Buysse et al. (1989) describe that the 19 items produce a total sleep quality score calculated from the addition of the seven component scores. The combined total score has a possible range of 0-21 points. A total score of >5 yields a sensitivity of 98.7% and specificity of 84.4% for sleep disturbances in people with insomnia versus controls (Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002). The tool takes a few minutes to complete.

Edinburgh Postnatal Depression Scale

The Edinburgh Postnatal Depression Scale is a 10 item questionnaire rated on a four point Likert scale (0-3) to screen emotional well-being in the general maternity population (Cox et al., 1987). A

large body of evidence supports the use of this tool to detect symptoms of depression in both the antenatal and postnatal periods in a wide range of culturally diverse populations (*beyondblue*, 2011). The woman is asked to select responses closest to her feelings over the last 7 days. Each response is given a normative score. An overall score is determined by adding the individual scores together. An overall score of 12/13 has been shown to have a sensitivity of 86% and a specificity of 78% with a positive predictive value of 73% ((Cheryl Tatano Beck & Gable, 2001). *beyondblue* (2011) identifies that most women and health professionals report a high level of acceptance of the tool which takes no more than a few minutes to complete.

Postpartum Bonding Questionnaire

The Postpartum Bonding Questionnaire (PBQ) is a screening tool used to detect disorders of the mother-infant relationship (Brockington et al., 2006). The tool is a 25 item questionnaire that asks the participants to record their recent experiences on a 6 point Likert-like scale (0-5) (Brockington et al., 2006). Positive responses are scored from zero (always) to five (never) and negative responses are scored from five (always) to zero (never). There are four sub-scales within the tool: a general factor scale, rejection and pathological anger, anxiety about the infant and incipient abuse. Each subscale is calculated to form an overall score. High scores indicate severe mother–infant relationship disorder (Brockington et al., 2006). With a maximum score of 125, Brockington et al. (2006) describe a score of 26 as achieving the maximum split between normal mothers and those with a disorder with a specificity of 61% and sensitivity of 84%. The tool can be completed in a few minutes.

4.9.2 Qualitative data

Qualitative data methods include data generation and collection, analysis of the data quality, rigor, presentation and dissemination of findings from interviews, documents, surveys and other forms of materials appropriate to the methodological lens of the study (Mills & Birks, 2014). As humans are complex biological, psychological, spiritual and emotional beings, the aim of researching human science is to explain the meaning of human experience (van Manen, 1990). Qualitative data is fundamentally interpretive, enabling the researcher to explore and describe the specific human experience in a holistic manner (Creswell, 2003). This research was conducted with the express desire to describe the human phenomena of becoming a mother of a selected group of women and understand how the experience influences how each woman lives in her world (van Manen, 1990).

Chase (2005) describes the interview as a conversation where questions are asked and listening occurs to produce situated understandings. Within the conversation the interviewee and the interviewer discuss a common topic of interest, with the interviewer guiding the conversation to ensure the research questions are answered (Brinkmann & Kvale, 2015). The interview provides a means for exploring and gathering experiential narrative material to develop a deeper understanding of human phenomenon (van Manen, 1990).

Five women from the ICU group agreed to participate in an interview. The interviews were semi-structured with open-ended questions that enabled the woman to tell her story in her own words with minimal interruption from the researcher. The interviews were conducted in a place where the woman felt comfortable or was convenient to her and at time that was convenient to her. The interviews were conducted at approximately six weeks after the birth of their baby. Two women

arranged for their interview to occur in an interview room at the hospital. Each of the remaining three women invited the researcher to conduct their interview at their home. The interviews were conducted with the women by themselves or with their baby. Pseudonyms are used throughout this thesis to protect the identity of the women.

4.10 Introducing the ICU women

The ICU women who consented to participate in an interview are introduced below. The information provided about each woman is very broad with no detailed clinical information included. Because of the small number of women requiring admission to the ICU, there is risk that a small amount of clinical detail could be identifying, particularly to clinicians from the health sector. The generic nature of the information provided is presented to protect the identity of the women.

Kimberly was 29 years of age when she gave birth at 38 completed week's gestation. Kimberley's admission to ICU was the result of a postpartum haemorrhage occurring during her elective caesarean section. Kimberly's interview was conducted at her home.

Jackie was 34 years of age when her baby was born prematurely by emergency caesarean section, as a result of fulminating pre-eclampsia. Jackie required admission to ICU immediately after birth when her pre-eclampsia became complicated by HELLP syndrome. Jackie's interview was conducted in an interview room of the neonatal unit where her baby was still an inpatient.

Jessica was 28 years of age and suffered from a chronic medical condition. Jessica's medical condition was exacerbated by pregnancy resulting in her baby being born at 37 weeks gestation by elective caesarean section. Her medical condition required management using complex interventions in the ICU. Jessica's interview was conducted at her home.

Sara was 30 years of age when she gave birth vaginally after spontaneous labour to a term baby. Sara was transferred from a rural hospital where she experienced a postpartum haemorrhage, to ICU at the tertiary hospital. Sara's interview was conducted in an interview room in the maternity unit at the tertiary hospital.

Kate was 40 years old when she gave birth at term by elective caesarean section. Kate experienced a postpartum haemorrhage that was managed in a secondary hospital prior to transfer to the tertiary unit for ICU care. Kate's interview was conducted at her home.

4.11 Overview of thematic analysis of this study

Thematic analysis is a foundational method of analysis in qualitative research through which patterns are identified and reported from within these data. Thematic analysis is independent of theoretical framework and epistemology enabling the researcher to make decisions about matching their theoretical framework with their research questions (Braun & Clarke, 2006). Patterns or codes in these data are identified through searching across the data set in a recursive way to find similar

themes or groups of themes from which conclusions can be drawn (Braun & Clarke, 2006; Miles, Huberman, & Saldana, 2014). This recursive process means these data are actively read and re-read to identify patterns, codes, and themes.

The method of the thematic analysis of this study was adapted from the six phase process described by Braun and Clarke (2006). The phases in the process are 1) familiarising oneself with these data, 2) generating initial codes, 3) searching for themes, 4) defining and naming themes and 6) producing the report (Braun & Clarke, 2006).

Phase one of the analysis process requires the researcher to become familiar with their data. In this study, familiarisation of these data were achieved through manipulation of the transcribed data into a Microsoft word document and formatting as a table. Each transcript was read, re-read, and reflected upon during the composition of the tables. This process fixed each story, removing the emotion and situation of the interview so that the words that formed the interview then become the focus of the analysis of the story (Brinkmann & Kvale, 2015).

Phase two of the analysis generated the initial codes through repeated reading and re-reading to identify patterns in each transcription. Words and phrases articulated by each woman that resonated with the author as important to the woman's experience were highlighted using the Microsoft word highlighting function (Miles et al., 2014). This process was applied to each transcribed interview so that the entire data set was considered (Braun & Clarke, 2006). The identified codes from each transcript were typed into the electronic table and written, by hand, in the researcher's notebook.

The handwritten codes from each transcript were grouped under that transcript so that all notes from the one transcript were visible on the same page.

During phase three of the analysis, the codes were examined for themes. Codes common to each data set were highlighted across the whole data set to identify common themes. A thematic map was hand drawn to assist the author with visualisation of the commonality of codes and possible themes.

Phases four and five of the analysis comprised reviewing, defining and naming of themes (Braun & Clarke, 2006). Visual cues from the thematic map were used to revise and regroup themes. Some themes did not have enough supporting evidence and were subsequently removed from the thematic map. Further examination enabled themes to be grouped together and renamed to reflect the essence of the theme (Braun & Clarke, 2006). The thematic map continued to be refined as the themes were refined. The report of these findings (phase 6) can be found in chapter 6 of this thesis.

4.12 Data analysis and integration

Yin (2014) argues that case study analysis is one of the least developed processes in case study research as the researcher's attention to detail in considering all the data collected, presentation and interpretation of the data is dependent on completion of the research process. As there are few formulae in case study research to guide the researcher in their analysis, quantitative data will inform the qualitative data so that this case can be described (Yin, 2014).

4.13 Chapter Summary

In this chapter, the study design and research methods have been addressed. Participant recruitment processes and procedures have been described. Quantitative and qualitative data collection and analysis methods have been discussed. Demographic data relating to the ICU women group have been displayed. The quantitative data methods have been outlined and will form the background to the findings discussions in Chapters five to seven.

Chapter 5 Outcomes

5.1 Introduction

In this chapter, the results and analysis of the quantitative data collected during this study will be presented and described. This includes chart audit results of 105 medical records described in chapter four and outcomes data collected from thirteen (13) women who had been admitted to ICU during pregnancy or birth. Follow up outcomes data collected from five (5) of these women approximately six weeks after the birth of their infant will also be described. These outcomes will be compared to data collected from forty (40) healthy women approximately six weeks after the birth of their infant.

The women who were admitted to the ICU for care are referred to throughout this chapter as the ICU women group. The healthy women who experienced normal birth of a healthy baby who formed the comparative group are referred to throughout this chapter as the healthy women group.

5.2 Case boundaries

The boundaries of this case were guided by the research questions and the ethical considerations of this high-risk group. The research questions focused on the phenomenon of becoming a mother and the woman's relationship with her baby and partner. Thus, the woman must have given birth to a

live infant. While this researcher believes that a woman who gives birth to stillborn infant is also a mother, this group was excluded, as there was no baby for the woman to develop an extra-uterine relationship with. The exploration of the recovery following an ICU admission for this group of women was outside the scope of this study.

Health service ethical approval was integral to the conduct of this study because of the nature of the study. Specific institutional ethics also contributed to the boundaries of the case. The age of the participants was one of these boundaries. Participants were required to be over the age of eighteen years to be able to consent to participate in the study. While women who are under the age of eighteen years and birthing is a common occurrence at the study site, the recruitment of these women was outside of the ethical approval of this study.

The capacity to provide informed consent to join the study was also a boundary to this case study. The focus of this case study was on women who experienced severe maternal complications during or after their pregnancy requiring the highest level of health care to restore their heath. These complications could be so severe that the woman's capacity to understand or to communicate her understanding of what was required of her could have been impaired or unable to be assessed. If the multidiscipline team assessment determined the woman was not able to provide informed consent, she was excluded from the study.

A final boundary for the case study was the timing of the data collection. The postnatal period is commonly recognised as the first six weeks after birth. Thus, the recruitment of participants was limited to this period.

5.3 Results: Quantitative data

All quantitative data collected through the chart review and self- report questionnaires were analyzed using IBM SPSS version 22 software. Non-parametric testing was used to analyse and compare data due to the small sample size (Polit & Beck, 2008). Kruskal-Wallis, Mann-Whitney U and Wilcoxon Signed Rank Tests were performed according to the type of data being analysed.

5.3.1 ICU Admissions: Chart audit

A Mann-Whitney U test was used to assess whether the length of stay differed by antenatal or postnatal point of admission. The Mann-Whitney U Test revealed a significant difference with a medium effect in the length of stay between antenatal (Md = 55, n = 19) and postnatal (Md = 29, n = 83) points of admission, U = 384.5, z = -3.474, p = .001, r = .344.

A Kruskal-Wallis Test was conducted to examine the relationship between maternal age and length of stay across the admission sources. Four admission sources were identified: The Townsville Hospital, regional hospitals, rural hospitals, and remote health services. There were no statistically

significant difference in age or length of stay across the four admission sources (TTH group, n = 45: regional group, n = 22: Rural group, n = 28: Remote group, n = 7), age χ^2 (3, n = 102) = 3.19, p = .364, length of stay χ^2 (3, n = 102) = .400, p = .940.

A Kruskal-Wallis Test found no statistically significant difference between length of stay and ethnic origin (Caucasian, n = 69; Aboriginal, n = 24: Torres Strait islander, n = 4; Aboriginal and Torres Strait Islander, n = 1: Asian, n = 1) χ^2 (4, n = 99) = 3.251, p = .517.

A Kruskal- Wallis Test was conducted to examine the relationship between maternal age and ethnicity. Five ethnic groupings were identified: Caucasian, Aboriginal, Torres Strait Islander, Aboriginal and Torres Strait Islander, and Asian. There was a statistically significant relationship between age and ethnic origin (Caucasian, n = 69: Aboriginal, n = 24: Torres Strait Islander, n = 4: Aboriginal and Torres Strait Islander, n = 1: Asian, n = 1) χ^2 (4, n = 99) = 15.179, p = .004. A Mann-Whitney U Test was conducted to further explore the relationship between maternal age and ethnicity within the groups. Bonferroni adjustment was made to the alpha level to control for error over three comparisons (alpha = .017). A Mann-Whitney U test reveals there is a statistically significant difference with medium effect in the age of Caucasian women (Md = 29, n = 69) and Aboriginal women (Md = 23.5, n = 24), U = 435, z = -345, p = .001, r = .358. All results within these groups are shown in Table 5.1 below.

Table 5. 1 Chart audit: Relationship between maternal age and ethnicity

	Md age (yrs.)	U	Z value	p value	r
Caucasian	29	435	-345	.001	.358
Aboriginal	23.5				
Caucasian	29	89	-1.190	0.234	
Torres Strait Is	34				
Aboriginal	23.5	14	2.236	0.25	
Torres Strait Is	34				

5.3.2 ICU women group

Thirteen women who had been admitted to the ICU during pregnancy or birth participated in this study. Each woman required life-saving interventions around the time of giving birth and was separated from her baby at or soon after birth so that she could receive the care she required in ICU.

Data measuring physical and mental health outcomes of the ICU women were collected at two time points after discharge from ICU. A Wilcoxon Signed Rank Test was conducted to examine if there was significant change in the scores of the components of each tool over the two-time points of shortly after discharge from ICU (T1) and at approximately six weeks after birth (T2). The

Wilcoxon Signed Rank Test revealed no statistically significant change in any of the sub-scales across the two-time periods. Table 5.2 demonstrates these findings.

Table 5. 2 ICU women: comparison between sub-scale scores at ICU discharge (T1) and 6 weeks (T2)

	Median Score	Z value	p value
HADS anxiety T1	11	-1.761	0.78
HADS anxiety T2	6		
HADS depression T1	4	-1.342	.180
HADS depression T2	4		
EPDS total T1	6	-1511	.131
EPDS total T2	4		
PBQ general factor T1	.23	-577	.564
PBQ general factorT2	.15		
PBQ rejection & anger T1	.00	-1.000	.317
PBQ rejection & anger T2	.00		
PBQ infant focus anxiety T1	.25	-1.633	.102
PBQ infant focus anxiety T2	.00		
PBQ incipient abuse T1	.00	.000	1.000
PBQ incipient abuseT2	.00		
SF36 physical health total sub-score T1	72	.000	1.000
SF36 physical health total sub-score T2	67		
SF36 mental health total sub-score T1	64	-0.948	.343
SF36 mental health total sub-score T2	66		
PSQI T1	9	-0.816	.414
PSQI T2	8		

The same data set was collected from forty (40) healthy women who had given birth normally, within a midwifery model of care at the study site, at approximately six weeks after the birth of their baby. These two data sets were statistically analysed using non-parametric tests to identify any differences between the two groups.

The relationship between the reasons for admission to the ICU and the woman's health and wellbeing was examined through the application of a Kruskal-Wallis test. Statistically significant findings underwent further analysis with a Mann-Whitney U test to quantify the difference between the two groups.

Data collected from the ICU women group and the healthy women group were compared using a Mann-Whitney U test to determine if there were any statistically significant differences between the ICU women and the healthy women across each of the tools employed in this study to determine if there was any statistically significant difference and if so, what that was. The analysis of and findings from the data for each tool is presented and discussed individually in the following paragraphs.

Hospital Anxiety and depression Scale

Anxiety and depression were measured against reasons for admission to ICU using the Hospital Anxiety and Depression Scale (HADS). Table 5.3 demonstrates the median and total median scores

for the HADS for each of the identified reasons for admission to ICU. The subscales of anxiety and depression are also demonstrated.

Table 5. 3 ICU women: Median Hospital Anxiety and Depressions (HADS) scores by ICU admission reasons at ICU discharge

Variable	Placenta praevia	Pre-eclampsia	APH	PPH	Influenza	Sepsis	other	Chi-square	d.f	Asym p. Sig.
HADS total	12.00	12.00	15.00	11.50	21.00	16.00	7.00	4.693	6	0.584
HADS anxiety	8.00	8.50	11.00	9.50	12.00	11.00	3.00	3.458	6	0.750
HADS depression	4.00	3.50	4.00	3.50	9.00	5.00	4.00	4.237	6	0.645

A Kruskal-Wallis test reveals there is no statistically significant difference in the HADS total scores (placenta praevia, $n = 1$: pre-eclampsia, $n = 2$: APH, $n = 1$: PPH, $n = 6$: influenza, $n = 1$: sepsis, $n = 1$: other, $n = 1$) χ^2 (6, $n = 13$) = 4.693, $p = 0.584$ or the subscales of anxiety and depression across all reasons for admission to ICU.

While not statistically significant, it was interesting that women admitted to the ICU for non-pregnancy related conditions of influenza and sepsis scored more highly in both subscales of anxiety and depression. It is described in Chapter four that women admitted to the study site ICU during the postnatal period for pregnancy related complications experienced a shorter length of stay that those women admitted during the antenatal period. Observation from clinical practice indicated that a longer hospital stay exposed the person to increased medical procedures and treatments. This

extended exposure may have predisposed the person higher levels of anxiety and depression. Further research is required to quantify this link.

The subscales of anxiety and depression of the ICU women group were compared to those of healthy women group at six weeks after birth. Table 5.4 demonstrates a comparison of scores between the ICU women and healthy women.

Table 5. 4 Median HADS scores by study group at six weeks

Variable	Healthy	ICU	z	Asymp.Sig
HADS anxiety	4.00	11.00	-2.667	0.007
HADS depression	3.00	4.00	-0.763	0.446

A Mann-Whitney U test revealed a statistically significant difference in the HADS subscale of anxiety scores of the ICU women group with a medium effect (*Md* = 11, *n* = 18) and the healthy women group (*Md* = 4.00, *n* = 40), *U* = 201.500, *z* = -2.677, *p* =0.007, *r* = .35. However, there was no statistically significant difference in the HADS subscale of depression.

As the sensitivity and specificity of the HADS subscales of anxiety and depression was 0.70 -0.90 with a threshold score of 8 or more, this data indicated that women in the ICU group were almost three times more anxious than the healthy women group at approximately six weeks after birth. However, the women in neither group reported clinically significant symptoms of depression.

Childbirth is commonly viewed as a stressful time for women as they adapt their life and lifestyle to motherhood. Anxiety is commonly associated with the adaption process as the woman learns new

skills to care for her newborn infant. This result identified that women who experience severe complications requiring ICU care in this study have compounding anxiety.

Short form 36

The general health status of the ICU women group was measured against reasons for admission to ICU. Table 5.5 demonstrates the total median scores for the Short form 36 Scales (SF36) for each of the identified reasons for admission to ICU. The subscales of physical function (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE) and mental health (MH) are also demonstrated. The subscales of physical function (PF), role physical (RP), bodily pain (BP), general health (GH) combine to describe a summary measure of physical health (PHYSHTH) and the subscales of vitality (VT), social functioning (SF), role emotional (RE) and mental health (MH) combine to describe a summary measure of mental health (MENTHTH).

Table 5. 5 Median Short Form 36 (SF36) scores by ICU admission reasons at ICU discharge

Variable	Placenta praevia	Pre-eclampsia	APH	PPH	Influenza	Sepsis	other	Chi-square	d.f	Asymp. Sig.
SF36 Total	104.00	96.50	92.00	102.00	91.00	0	91.00	3.244	5	0.662
SF36 physical function	30.00	17.50	25.00	21.00	19.00	19.00	14.00	6.871	6	0.333
SF36 role physical	6.00	4.50	3.00	6.00	6.00	3.00	6.00	6.059	5	0.300
SF36 Bodily pain	8.00	8.50	9.00	6.00	4.00	9.00	5.00	9.740	6	0.136
SF36 General health	14.00	19.50	23.00	15.50	16.00	14.00	22.00	9.729	6	0.137
SF36 vitality	17.00	14.00	10.00	10.50	15.00	15.00	11.00	7.223	6	0.301
SF36 social functioning	6.00	6.50	6.00	6.00	6.00	5.00	6.00	5.400	6	0.494
SF36 role emotional	6.00	4.50	3.00	6.00	6.00	3.00	9.40	9.400	6	0.152
SF36 Mental health	18.00	22.00	11.00	21.50	17.00	22.00	23.00	6.380	6	0.382
SF36PHYSHTH	74.00	63.50	72.00	67.50	62.00	0	56.00	5.156	5	0.397
SF36MENTHTH	64.00	70.00	55.00	64.00	62.00	62.00	71.00	5.894	6	0.435

A Kruskal-Wallis test revealed there was no statistically significant difference in the SF36 total scores (placenta praevia, $n = 1$: pre-eclampsia, $n = 2$: APH, $n = 1$: PPH, $n = 4$: influenza, $n = 1$: other, $n = 1$) χ^2 5, $n = 10$) = 3.244, $p = 0.662$ or in any subscales of across all reasons for admission to ICU.

The subscales of SF36 of the ICU women group were compared to those of healthy women group. Table 5.6 demonstrates a comparison of scores between the ICU women and healthy women.

Table 5. 6 Median SF36 scores by study group at six weeks

Variable	Healthy	ICU	z	Asymp.Sig
SF36 physical function	29.00	19.50	-3.357	0.001
SF36 role physical	8.00	5.00	-2.721	0.007
SF36 Bodily pain	3.00	6.00	-3.642	0.000
SF36 General health	15.00	16.00	-1.427	0.154
SF36 vitality	14.00	13.00	-0.140	0.889
SF36 social functioning	6.00	6.00	-0.865	0.387
SF36 role emotional	6.00	6.00	-0.914	0.361
SF36 Mental health	22.00	21.00	-0.71	0.944
SF36 PHYSHTH	68.00	64.50	-0.954	0.340
SF36 MENHTH	64.00	64.00	-0.569	0.570

A Mann-Whitney U test revealed that there was a statistically significant difference with medium to large effect in the SF36 Physical function score across the ICU women group (Md = 19.50, n = 17) and healthy women group (Md = 29.00, n = 39), U = 147.00, z = -3.357, p = 0.001, r = 0.44. The physical function score was comprised of self-assessment scores of a persons' ability to physically undertake, with moderate effort, specified activities, such as climbing stairs, walking various distances, performing house hold chores and self-care. This result indicated that, at approximately six weeks after birth, the ICU women found these physical activities more difficult to perform than the healthy women.

The physical role sub-scale measured the person's self-assessment of how their physical health affected their ability to accomplish the activities they would like to undertake. The questions relate to whether the person thought they could undertake the activities they wanted to complete and the whether they could be achieved. A Mann-Whitney U Test found there was a statistically significant difference with a medium effect in the SF36 physical role subscale between the healthy women group (Md = 8.00, n = 39) and ICU woman group (Md = 5.00, n = 16), U = 177.00, z = -2.721, p = 0.007, r = 0.37. This result indicated that, at approximately six weeks after birth, the healthy women felt their health affected their ability to conduct and complete the daily activities they wanted to achieve when compared to the ICU women group.

The bodily pain sub-scale was a self-assessment of the amount of pain a person had and how much their pain affected their normal activities. A Mann-Whitney U Test demonstrated a statistically significant difference with a large effect in the SF36 bodily pain subscale between the ICU group (Md = 6.00, n = 18) and healthy woman group (Md = 3.00, n = 40), U = 147.50, z = -3.642, p = 0.000, r = 0.48. This result indicated that, at approximately six weeks after birth, ICU women report more severe or limiting bodily pain than the healthy women.

These results indicated that the ICU group women continue to experience more pain and discomfort after the birth of their baby when compared to the healthy women group over the first six weeks after birth. However, these results described that the healthy women reported they felt their physical health limited their ability to undertake regular daily activities more than women in the ICU group.

The current discourse related to normal birth as a normal physiological event may influence societal expectations on the healthy women group to resume their life as it was before they gave birth, with

little emphasis on rest and recovery from birth. The results of this study indicate that healthy women may place expectations upon themselves to resume normal life after they have given birth with little consideration of their physical health and recovery needs. In comparison, women who experience complications and surgical procedures related to their birth are perceived by society to require recovery time. In clinical practice, women experiencing surgical interventions during childbirth receive advice about resting and restricting themselves for several weeks from many common household activities such as lifting heavy items, hanging washing on the clothes line and driving a car. This advice may assist ICU women to perceive the value of rest and recovery and "taking it easy" as they manage their bodily pain and physical discomfort. The concept of "taking it easy" may have influenced women in the ICU group to expect that their activity will be reduced.

Pittsburgh Sleep Quality Index

The quality of sleep of the ICU group was measured against reasons for admission to ICU using the Pittsburgh Sleep Quality Index (PSQI). Table 5.7 demonstrates the total median scores for each of the identified reasons for admission to ICU.

Table 5. 7 Median Pittsburgh Sleep Quality Index (PSQI) scores by ICU admission reasons at ICU discharge.

Variable	Placenta praevia	Pre-eclampsia	APH	PPH	Influenza	Sepsis	other	Chi-square	d.f	Asymp. Sig.
PSQI	9.00	9.00	15.50	13.00	8.00	16.00	13.00	7.649	5	0.177

A Kruskal-Wallis test reveals there is no statistically significant difference in the PSQI total scores (placenta praevia, $n = 1$: pre-eclampsia, $n = 2$: APH, $n = 1$: PPH, $n = 6$: sepsis, $n = 1$: other, $n = 1$) χ^2 $(5, n = 12) = 7.649$, $p = 0.177$ across all reasons for admission to ICU.

While there was no statistically significant difference found between the reasons for admission to ICU within the ICU group, the median scores were of interest as a total score of greater than five (5) indicated moderate to severe sleep difficulties across the subscales that comprise the tool. Each of the sleep quality indicator variables for ICU admission reasons identified a median score two to three times higher than the clinical cut off score.

The subscales of the PSQI of the ICU women group were compared to those of healthy women group. The subscales measured are habitual sleep efficiency (PSQIHSE), sleep disturbance (PSQIDISTB2), sleep latency (PSQILATEN) and daytime dysfunction (PSQIDATDYS).
Table 5.8 demonstrates a comparison of scores between the ICU women group and healthy women group at six week after they have given birth.

Table 5. 8 Median PSQI scores by study group at six weeks

Variable	Healthy	ICU	z	Asymp.Sig
PSQI habitual sleep efficiency	3.000	3.000	-1.497	0.139
PSQI sleep disturbance	1.000	2.000	-2.473	0.013
PSQI sleep latency	1.000	2.000	-1.848	0.065
PSQI day time dysfunction	1.000	1.000	-.682	0.495

A Mann-Whitney U Test confirmed there was a statistically significant difference with a medium effect in the PSQI sleep disturbance between the ICU group (*Md* = 2.000, *n* = 18) and healthy woman group (*Md* = 1.000, *n* = 40), *U* = 230.0, *z* = -2.473, *p* = 0.000, *r* = 0.32.

Each woman in each group of this study had a very young baby in her care that required regular feeding including night feeds. There were no statistically significant differences between the ICU and Healthy women groups on scores related to the amount of time the women in each group took to go to sleep, and how long they slept for or effect of their sleep on their daytime function. However, these results indicate that the women in the ICU group reported more disturbed sleep at night than women in the healthy group.

Edinburgh Postnatal Depression Scale

The level of depression of the ICU group was measured against reasons for admission to ICU using the Edinburgh Postnatal Depression Scale (EPDS). Table 5.9 demonstrates the total median scores for the Edinburgh Postnatal Depression Scale (EPDS) for each of the identified reason for admission to ICU.

Table 5. 9 Median Edinburgh Postnatal Depression Scale (EPDS) scores by ICU admission reasons at ICU discharge

Variable	Placenta praevia	Pre-eclampsia	APH	PPH	Influenza	Sepsis	other	Chi-square	d.f	Asymp. Sig.
EPDS	5.00	8.00	12.00	8.50	16.00	6.00	2.00	7.986	6	0.546

A Kruskal-Wallis test revealed there was no statistically significant difference in the EPDS total scores (placenta praevia, $n = 1$: pre-eclampsia, $n = 2$: APH, $n = 1$: PPH, $n = 6$: influenza, $n = 1$: sepsis, $n = 1$: other, $n = 1$) χ^2 (6, $n = 13$) = 7.986, $p = 0.546$ across all reasons for admission to ICU. An examination of the median scores of this study group showed that women admitted to the ICU for antepartum haemorrhage and influenza reported scores that were at or above the threshold scores of 12/13 for clinical intervention. These individual scores were important to recognise so that appropriate referral processes could have been actioned. Further research is required to determine if the findings of this study can be more broadly applied to these complications and reasons for admission to the ICU.

The EPDS scores of the ICU women group were compared to those of healthy women group. Table 5.10 demonstrates a comparison of scores between the ICU women and healthy women.

Table 5. 10 Median EPDS scores by study group at six weeks

Variable	Healthy	ICU	Z	Asymp.Sig
EPDS	5.00	9.00	-1.113	0.266

A Mann-Whitney U Test confirmed there was no statistically significant difference in the median EPDS scores of the ICU group ($Md = 9.00$, $n = 18$) and healthy woman group ($Md = 5.000$, $n = 40$), $U = 294.0$, $z = -1.113$, $p = 0.266$. This result concurs with the findings of the HADS depression subscale measured and discussed earlier in this chapter. Thus, there were no reported differences between ICU and Healthy women on measures of both general and postnatal depressive symptoms at 6 weeks after birth.

Postnatal Bonding Questionnaire

Disorders in the maternal infant relationship were screened using the Postpartum Bonding Questionnaire (PBQ). The screening tool assessed the level of disorder in the ICU group measured against reasons for admission to ICU. Table 5.11 demonstrates the total median scores for the Postnatal Bonding Questionnaire (PBQ) for each of the identified reasons for admission to ICU.

Table 5. 11 Median Postnatal Bonding Questionnaire (PBQ) scores by ICU admission at ICU discharge

Variable	Placenta praevia	Pre-eclampsia	APH	PPH	Influenza	Sepsis	other	Chi-square	d.f	Asymp. Sig.
PBQ	0.00	1.8942	2.0962	0.9103	0	0.2500	1.2308	4.371	5	0.497

A Kruskal-Wallis test reveals there is no statistically significant difference in the PBQ total scores (placenta praevia, $n = 1$: pre-eclampsia, $n = 2$: APH, $n = 1$: PPH, $n = 6$: sepsis, $n = 1$: other, $n = 1$) χ^2 $(5, n = 12) = 4.371$, $p = 0.497$ across all reasons for admission to ICU. The reported median scores are below the threshold indicating that all mothers in the study group have no disorder in the mother-infant relationship.

The median PBQ scores of the ICU women group were compared to those of healthy women group. The subscales of a general factor (PBQIB), rejection and pathological anger (PBQRA), infant focused anxiety (PBQANX) and incipient abuse (PBQAB) were examined to compare any disorder the maternal infant relationship between the ICU women group and the healthy women group. Table 5.12 demonstrate these findings.

Table 5. 12 Median PBQ scores by study group at six weeks

Variable	Healthy	ICU	Z	Asymp.Sig
PBQ general factor	0.15	0.31	-0.282	0.778
PBQ rejection & anxiety	0.08	0.00	-1.1077	0.281
PBQ infant focus anxiety	0.50	0.50	-0.485	0.628
PBQ incipient abuse	0.00	0.00	-0.629	0.529

A Mann-Whitney U Test confirmed there was no statistically significant difference in the median subscales of the PBQ scores. No mother was identified as having a disorder in her relationship with her infant.

5.4 Chapter summary

In this chapter, the quantitative data collected from participants during this study have been described and analysed. The outcomes of the data have identified that at approximately six weeks after birth, the ICU women group are statistically significantly more anxious that the healthy women group. It is argued that a longer length of stay in the ICU may contribute to this anxiety. While the ICU women group may be more anxious than their healthy counterparts, there is no difference in the level of depression.

The women in the healthy women group were found to have more difficulty carrying out their daily activities at six weeks after the birth of their baby than those in the ICU group, even though the ICU women had more pain and were more limited by their physical health to undertake normal activities of daily living. It was argued that the current discourse in relation to normal birth has created a

community expectation that healthy women will "get on with it" following birth with little allowance for rest and recovery or expectation that it is required. It was contended that community recognition of the need for rest and recovery following major health events around childbirth that enabled the women in the ICU group to expect they would be not be able to undertake normal activities while they recovered from their birth.

While both groups of women were found to have sleep disturbance, the ICU women group were found to have significantly more sleep disturbance at night than the healthy women group. However, it is unknown why this occurs. Ongoing pain and anxiety may contribute to the sleep disturbance in the ICU women group.

The following chapter continues to build the case of the woman experiencing admission during pregnancy or birth. The impact of the experience of severe maternal complications requiring ICU admission will be explored through analysis of the stories of the women. These stories were collected during semi–structured interviews, transcribed verbatim and thematically analysed.

Chapter 6 Impacts

6.1 Introduction

In this chapter, the impact of admission to ICU around the time birth is explored through the words of the women interviewed during the conduct of this study. Five women agreed to be interviewed to tell their story about their admission to the ICU. The process of analysing the women's stories identified three themes. These themes relate to the woman's experience, her baby and her partner. Data analysis identified sub-themes within each theme. The themes and sub-themes revealed that the women were anxious about their own health, the wellbeing of their baby and their partner. The women employed internal and external mechanisms to manage and resolve their anxiety. The woman's partner was identified as integral to her experience and the most important support for the woman throughout her experience.

6.2 Beginning the story

Each woman shared her story about admission to the intensive care unit with a description about the day of her baby's birth. Each woman's birth story was unique. Kimberly, Jessica and Kate presented to hospital for a planned elective caesarean section due to risk factors identified during pregnancy. Each of these women chose an elective caesarean section for their birth mode to reduce their risk of complications following birth. Sara and Jackie had planned a vaginal birth. While Sara experienced her planned vaginal birth, Jackie's pregnancy ended prematurely with an emergency caesarean section for pregnancy complications.

Kimberly recalled her response on the day of her caesarean section:

> *I was obviously considerably nervous after what had happened with my first child's birth when I'd been admitted to ICU for that one as well for basically the same thing, the post-partum haemorrhaging and I guess I felt as though most people were brushing it off saying, "It'll be okay, you're having a caesarean this time".*

Jessica began her story with a description of the congenital medical condition that she explained impacted on her ability to fall pregnant and that carried risks associated with her pregnancy:

> *I've got a medical condition, congenital hepatic fibrosis so that affects my liver and my sleep and I have varicose veins in my oesophagus so I knew for a while that I wanted to have kids and I'd discussed that with my doctors in years previously so I always knew that it may be a bit of a challenge for me because of my spleen I have a really low platelet count so bleeding can be a risk for me … So I'd known from the start though that my birth might not be a standard one. I was always under the impression that I would have to have a caesarean.*

Kate described how her birth plan was for an elective caesarean section because of the position of her placenta that could result in severe postpartum haemorrhage:

> *My caesarean was pre-planned because we knew I had placenta praevia, I was booked in so I was 37 weeks and five days. They moved my procedure to the main campus at the hospital because they thought there may be complications with postnatal bleeding.*

Sara was planning for a normal vaginal birth and was passed her due date on the day she gave birth:

> *I was five days overdue that day and I woke up in the morning and I'd had a bit of a bloody show in the morning but nothing happened, I wasn't contracting … that afternoon and I went to go to the toilet at four o'clock and sat down on the toilet and heard a pop and a trickle into the toilet. And I had a look in there and I could see that my waters had broken and that had meconium in the waters*.

Jackie stated she felt unwell the day her preterm baby was born:

> *I was very sick, I went to the hospital. The doctors were contacted at the tertiary Hospital… They decided it would be better for me to come to the (tertiary) Hospital and they sent me in an ambulance… that was in the middle of the night. It was around 3:00am.*

6.3 Data reduction

Three themes were identified during analysis of the women's interviews with subthemes drawn from each theme. While the themes are independent of each other, the sub-themes of each of the themes are closely related, interwoven and, at times, overlapping to create each woman's story. Reading and re-reading each transcript examined the threads of each woman's story. The women were insightful of their physical condition even if they did not know or understand what was happening to them at the time. Each woman remained strongly connected to her baby even though she was physically isolated from her baby. They were focussed on the emotional and physical health and wellbeing of their baby. The partner of the woman was important to the overall health and wellbeing of the

woman being an advocate for her and providing a conduit to their baby. Table 6.1 below displays the themes and sub-themes identified in the interview data.

Table 6. 1 Themes and sub-themes

Main theme	Sub-themes
Responding to the situation	Being anxious
	Managing anxiety
	Moving on
Being separated from the baby	Physical isolation
	Emotional concerns
Being a supportive partner	Being present
	Being a protector

6.4 Theme One: Responding to the situation

Responding to the situation was the first theme identified in the data analysis. Each woman related, in detail, what she was thinking, how she felt and what she was concerned about during her experience. Each woman remembered the people and events surrounding her, during her experience.

As each woman told her story, she appeared to relive some parts of her experience, pausing from time to time to collect her thoughts and to compose herself.

6.4.1 Being anxious

Analysis of the interviews identified "being anxious" as the most common response to the situation. Even when the woman had planned her birth and was aware of the complications, she described being anxious about the unknown of what would happen next. The unknown included her own physical condition, the procedures that were required to be performed, outcomes for her baby and her own mortality.

For Jackie, being advised that a caesarean section was the recommended option for the best outcome for her premature baby and herself, was confronting:

> *And the doctor say to me, told me, that no, I have to have a caesarean surgery because if she will continue inside of me it will be possible to die. So I didn't want it, I cry a lot and I didn't want to accept it but at the end that was the only solution.*

Each woman expressed anxiety about her physical condition as she was aware of how she normally felt and knew the feelings she was experiencing were not normal for her. Each woman was aware that she was acutely unwell. Kimberley offered:

I remember saying to them, "I feel like I'm going to throw up." And they said that's to do with my blood pressure or something dropping. And I had a few vomits and things throughout it but I knew something was going wrong, I could feel it… but I actually felt really sick and not right and I started to recall the same feelings that I had with my first baby when I had given birth to him…which I knew was not a good sign… I started to somewhat panic myself not that I could say or do much.

Jessica also described how she felt anxious about what was happening to her:

I can remember in my head just saying all the time, "Something's not right. Something's not right. I shouldn't be this tired. I knew that something wasn't as it should be.

Sara's anxiety about her physical condition was palpable:

Because I thought if I get to a point where I have to continually fight like this I'm not going to be able to do it because it was so hard trying to breathe when it was literally like the air was being taken out of you and you were just gasping for breath… my vision was all going black and I'm thinking, "Oh my god, what's happening?"

Kate recalled how the emergency measures to save her life caused her anxiety:

I just remember them pressing down on my stomach trying to see if the blood was coming out. My stomach was really distended so they put a nasal gastric tube down my throat and drained my stomach and did an x-ray and they found my bowels were dilated 10cm… I was

just sitting there in an absolute slump. I felt terrible and I started getting very anxious that day.

While Sara's anxiety about her physical condition and that of her baby was heightened by the situation that occurred when the ambulance arrived:

They (ambulance service) got there and the first thing they said to my partner is, "Have you got diesel?" They had run out of petrol. So, my partner had to take them over to the shed to put fuel in the ambulance, so it was all very stressful and all over the place. And the guy that was with me, it seemed like he didn't know what to do with me so he was just doing what he could do with my observations.

Kimberly and Sara reported feeling anxious about their mortality and had thoughts that they could die. Kimberly had experienced a major haemorrhage after the birth of her first baby. She verbalised her fear that she could die to a doctor prior to having an elective caesarean section for the birth of her second child:

... there was one doctor who could see that I was nervous and actually asked me, "What is it that you're actually frightened of?" and I said, "Bleeding to death." And he actually said that that was a legitimate thing to be frightened of considering what had happened in my first time.

Sara recalled thinking that she could die while she was haemorrhaging in the ambulance on the way to hospital. She recounted:

> *I just got weaker and weaker and I had probably three or four episodes of where I had to pretty much fight to stay in my body because I could feel myself going and, physically what that felt like was I couldn't breathe so I was really, really fighting to breathe. But what I was trying to say was "Something's happening here, I think I'm dying."*

Kimberly's awareness of the possibility that she may die if the bleeding was unable to be stopped caused her to be anxious:

> *... they thought that I was still bleeding internally so they wanted to check for what they called active bleeding through the CT scan, which obviously was quite frightening because I thought if they can't stop the bleeding I'm going to die.*

Sara explained how her anxiety was compounded by staff attitudes when she arrived at the hospital:

> *I had false labour with her at 37 weeks and I went to the (rural) hospital, in labour and they turned me away because with my history and made me come to the (tertiary) hospital because he (medical officer) didn't want me there… and, then I rock up on his hospital doorstep in the back of an ambulance almost dead from a massive bleed. And I could tell when I got there that he was annoyed with me because he barely communicated with me and his body language and when I saw him when we went into theatre and I could just tell that he was annoyed with me… so that was hard.*

6.4.2 Managing Anxiety

As described above each woman recounted different events during the course of their care that caused them to be anxious. Each woman identified ways in which she managed her anxiety in response to her situation. 'Managing anxiety' was identified as a sub-theme. The women described how accepting the care and concern of the staff caring for them relieved their anxiety. Jessica and Jackie described how their anxiety was lessened by the staff interactions with them. Jessica recounted:

> *I remember there being a doctor with me, it felt like all night, they were constantly checking and doing different things and seeing what's wrong… I didn't feel like I was sitting there all-alone and something wasn't right and no one was helping me sort of thing. I can remember someone constantly being there with me, checking on me, doing things.*

While Jackie remembered:

> *The nurses were always looking after me really well and they were really nice to me. There was a Columbian nurse in the intensive care. Yeah, it was quite sweet I think because I was able to speak Spanish with her. I was speaking English with her and was later on that she told me, "I'm from Columbia" and I am from Columbia too and that was quite nice and we started to speak about things over there and being here. And that was really relaxing for me.*

For Sarah, the actions of her caregiver helped her be calm and the focus on staying alive assisted her to manage her situational anxiety. Sara recounted:

> *…another ambulance lady jumped in with us and literally had to support her (the baby) because I was a rag by then, I couldn't do anything. And she sat at my head and she was just touching me and talking to me and just saying, "Stay with me, just keep looking at me" and stuff.*

Being in a place where they felt both physically and emotionally safe was important to the way the women responded to their situation and managed their anxiety. Trust in their caregivers and the healthcare system provided the women with reassurance and confidence they would be cared for. Kate recalled:

> *… all I remember is waking up and … it's all a bit of daze and I just remember them pushing and pushing my stomach and I was screaming. And then they took me into theatre again and I remember laying there just saying whatever… I'd signed a consent form and I said, "Whatever you have to do, do." I don't know if I was worried so much as thankful I was in theatre and I knew that I was in the right place to be fixed.*

Jessica also described how her anxiety was relieved when she felt reassured by her surroundings and the people providing her care:

> *It wasn't ideal but we weren't too upset about it because I guess the way we thought about it was at least we know we're having a general, it wasn't like we were going to get halfway through a birth, something go wrong… I just accepted it, like I had seen all of those doctors previously so I was familiar with all of them, I had met them all before and was confident in their treatment.*

Jackie however was more circumspect about the inevitability of her situation:

> *...go with the flow practically was the way and trusting in the people because you don't have family here, you don't have your husband here. It's like, "Okay, well the doctor who is practically telling me what I have to do and the decision that I have to take, yeah, just go with the flow."*

6.4.3 Moving on

Women interviewed shared how they recovered from their experience. There was a strong sub-theme of moving on with their life. Each woman demonstrated reflection on their experience as part of the pathway to their discussion of how they are now.

Jackie reflected on her experience:

> *It is difficult because sometimes I want to cry still, I know that, sometimes I do miss not having our birth history. It's just it's something that always will be there. Now with Juanita [her baby) it is important is see that she grows.*

Sara also recounted aspects of her situation that she felt impacted on her experience:

> *...but I'm battling myself too with what I went through ...It was just that we lived so far out of town that... I mean, had we been in town the bleeding probably wouldn't have been as severe because we would've got to hospital much quicker but that wasn't how it was meant to be.*

Each woman described in their own way, how they had drawn a line in the sand to move on and look forward to the future:

> *So that was, okay, next page, pass all the pain and the sad story and leave it for the next one, for the next pregnancy we'll be alright (Jackie).*

> *… but I guess it gets to a point where you've got to just let it go, you can't just keep dwelling on the fact that it happened. So, I mean I do think about it but I don't let it affect me. I can get emotional talking about it (Kimberly).*

Time is often referred to as a healer following a crisis. Kate and Jessica were able to clarify how time influenced their recovery from their experience. Kate said:

> *…when I was out (of hospital) I actually started to feel a bit more, I don't know, better within myself I think, and I started to let go of the drama that happened and I could see that there was a light at the end of the tunnel, it wasn't all doom and gloom. Once I hit four weeks I was pretty good and I had a lot more positive outlook.*

Jessica reflected on her recovery;

> *It wasn't until that sixth week where I was by myself with him (baby) that I found my groove a bit, and I don't know if that's just because it was just me and him and I had to do what I had to do… In my day to day life I feel quite healthy.*

Sara describes her battle to move on and why she found it so difficult:

> *I had been holding off on talking about it for the first week or so because I knew that every time I tried to talk about it I just started crying and just get that knot in my chest and I couldn't and I wasn't ready to communicate it. I could put it down in writing but to talk about it was just too hard so, I went into town to talk to a midwife that had been doing all my antenatal care. I talked to her about it and I broke down with her… Because talking about everything that I experienced is hard because you're going down to the finer details of what you felt.*

6.5 Theme two: Separation from baby

While the commencement of the extra-uterine relationship with her newborn baby was different for each woman in this study, each woman experienced a period of time when she was separated from her baby during her ICU admission. Regardless of the length of this time, it was an important factor for each woman. Separation from baby was the second theme identified during analysis of the interview data.

Prior to being admitted to ICU, Sara, Jessica and Kimberly were able to spend some time with their baby, while Jackie and Kate did not meet their baby until the day following the birth. Regardless of the timing of the separation, the effect of being separated from her baby was prominent in the discussion of each woman in this study. Each woman articulated how she felt about being separated

from her baby. The women in this study demonstrated that by the time their baby was born, they were concerned about every aspect of their baby's life even when their own life was at risk.

Two sub-themes, physical isolation and emotional concerns, were identified in the analysis relating to separation from the baby. These sub-themes demonstrate how separation of the mother from her baby at, or soon after birth caused the women to worry about all aspects of their baby's existence.

6.5.1 Physical isolation

For each woman in this study, her physical condition did not diminish her desire to know her baby. Participants described how staff promoted the physical reality that birth had occurred. While the women described how this provided them with some feeling of ownership of their baby and opportunity to feel a bond with their baby, the women also described how this was no substitute for being able to hold their baby and how they longed to meet their baby in person. Jackie described her experience:

> *Where is my baby? I want to see her. I want to hug her, who is she? That's all and I asked the nurses and the nurses they were telling me they were updating me every time to time that they were there.*

Each woman described how, without physical contact with their newborn baby, they had no certainly about their motherhood or the physical wellbeing of their baby. Kate described how she felt:

> *It wasn't that big celebration that you'd normally have … I know it was nothing bad but he was in the special care nursery so I just felt a bit, I don't know, I suppose distant from it all… Separated. Detached. Yeah, you know like I didn't get that connection, I was like, the baby's out but there's no baby.*

While each mother was in possession of photos of her baby, this did not satisfy their need to meet and know their baby in person. Delays in meeting their baby heightened the mothers' desire to begin to create the "firsts" in their physical relationship with the baby.

Jessica recalled:

> *I think my thing that I was concerned about was family would come up and someone would get to see the baby before me, that was my biggest thing that I fixated on - that someone's going to get to hold my baby before I do.*

While Jackie recalled:

> *I always dreamt … you're the first person to hug the baby because somebody is passing to you and you cry because you see the baby and you are there with your husband, it didn't happen to me… and so I missed all that… missing that big part of the history.*

Kate recounted the first time she met her baby:

No. It didn't feel real until I saw him I think. The relationship didn't feel real until I met him. I mean I knew that he was born, I knew that, you know what I mean?... I would say the birth to me was when we met each other at the (tertiary) hospital, to me that was like the birth because we came together it was, to me, that was like him coming out because that was my first time seeing him.

6.5.2 Emotional concerns

The establishment of a relationship with their newborn baby was an emotional concern for each woman in this study. Each woman's narrative highlighted how the physical isolation from their baby highlighted their emotional concerns about their baby. Kate was concerned that her baby would not know her when they met for the first time:

You worry about is he going to be able to see, is he alright, I'm not there. Is he going to know that I'm his mum?

Each woman's emotional concerns for her baby was strongly linked to her physical ability to provide care for her baby. Jackie explained:

I was really, really worried (that I) don't make the bond with the baby so I was really stressed about breastfeeding ... I couldn't have my last three months of pregnancy where my breast grows and everything develops for breastfeeding properly ... because I really want to have a bond with Juanita so I need to do it (breastfeed) and I need to do it properly.

Kate highlighted this point stating:

> *I remember just thinking about Dominic, that he wasn't there and I was worried about him not getting fed… The first time I'd seen him was about 36 hours or so after his birth and I cried a lot and I was worried about him not attaching but because I'd expressed some colostrum they gave him a bit of colostrum and then he attached straight away.*

The concern of a mother for her baby was a reason for fighting to stay alive. Sara recounted:

> *…what I was saying to myself, "Sarah, just look at your baby. Just focus on her, you've got to fight this" and that's what I kept doing when I was going into these episodes (blackness)… struggling to try and hold onto her.*

While Kimberly offered:

> *… I could hear them talking about being an issue with the blood… And I remember being fearful of that and saying I didn't want to die because I didn't want to leave my babies without their mum.*

The staff at the hospital played an important role in promoting physical and emotional connections between each woman and her baby. Jessica recalled:

> *They (staff) suggested that we could express some colostrum before and things like that and it was nice to know that even though I was out of action for a little bit he was getting the nutrients and things that he needed.*

Jackie's experience was similar. She offered:

> *... they told me that the baby was there and the girls were coming to visit me and tell me about my baby and even one of the nurses did something really nice. They took my phone and took photos of my baby with my phone. I was just looking at photos and I met my baby through the photos and it was a really, really nice gesture from this nurse.*

6.6 Theme three: Being a supportive partner

Each woman interviewed in this study had a male partner with whom she lived. Each partner was present during the woman's ICU admission. Each woman discussed her partner, his reactions and her expectations of her partner at length during her interview. The manner in which each woman described the role of her partner during her catastrophic event and subsequent ICU admission was influenced by her previous experiences, her willingness to share the experience with her partner and, her willingness to hand over control of her life to her partner. Even though the women were acutely unwell, they remained aware of, and sensitive to, their partner's reactions and responses to the situation. "Being a supportive partner" was identified as the third theme by the data analysis.

Jessica's previous experience influenced her decision-making regarding the presence of her partner. Jessica recounted further reflection on her experience:

> *…. this time around I know that he has tried to be there a lot more… But I did feel terrible and I was so excited when they offered for him to come down. He managed to stay for a lot longer hours and tried to be there a lot for me…*

Sara's partner had also been present at two previous births during which serious complications occurred. Throughout this pregnancy, Sara's partner was not supportive of her birth plan for this birth. Sara perceived her partner's worst fears would have been realised as her birth complications occurred. Sara felt this caused him to hold some resentment towards her for her decisions. Sara related:

> *…he was scared that I was going to bleed again and … then it happened again so I'm sure …he's holding in something there. And I'm sure he probably is harbouring some of that (resentment) too because I made this decision to have a birth at home knowing my risks and he didn't fully want to do it and it happened again and he nearly lost me. So I'm sure he's probably feeling, "Why did you do it?*

However, Sara's partner's response when she began to haemorrhage demonstrated that he was there for her:

> *… my partner pretty much just said to me, "You need to be strong now, you know what…" because I have been there before and had two big bleeds before and he said, "You need to be strong, now you need to fight".*

Kate also discussed her partner's emotions during and after her catastrophic event. Kate described how he became concerned for her ongoing health when decisions were being made about her care without discussion with him. This concerned was heightened when he didn't agree with the medical plan of care. Kate's partner became her strongest advocate, initiating an alternative plan of care.

> *… he (husband) was saying I probably had an ileus… So, my husband said to the staff in the ICU that he didn't want me to have to go back to the Women's Hospital where they didn't have facilities if something else went wrong. He wanted me to stay at the (General Hospital) and have the baby move there, they wouldn't do it. So, he ended up organising himself through my obstetrician to get me transferred to the tertiary Hospital.*

Analysis of the data identified two sub-themes that described the role the partner played in the women's discussion, 'being present' and 'being a protector'.

6.6.1 Being present

Each woman described her partner's presence during and after her catastrophic event and ICU admission. Throughout her discussion, Jessica described herself and her partner as a pair throughout their experience, indicating that her partner being present was the equivalent of her being present. Jessica demonstrated this throughout her discussion:

> *And in-between getting those results back, we found out we were pregnant and then when we went to our next appointment, because we found out like only a few days before… We also had to have quite a few scans to check for abnormalities and measurements ... So we're very, very, very lucky because between the two of us we weren't quite… we did discuss maybe having a vaginal birth.*

Jessica's partner's presence was important to Jessica to ensure that their plan for their baby was followed. This provided her with reassurance. Jessica recounted:

> *…he was like super dad, he got to do the first feed and the cuddle and the first nappies and things like that. I was out of action, even just with pain, not even considering the night before that I'd had, like, so sore, like you've just had your abdomen cut up. But he was there and he was like, "Oh his nappy's dirty, I'll change it."*

Sara wanted to share her experience at an emotional level, describing how she wanted to tell her partner about how she feared she was going to die before and during her operation and how she felt when she woke up after the surgery. Sara describes how finding the language to open this communication channel proved to be difficult for her but she found strength from his presence:

> *I was trying to tell him that I thought I was dying… I don't know why I needed to tell him that, but I think the fact that I had woken up and I was still here was the biggest thing, that I didn't go to sleep and didn't die in theatre and didn't die in my sleep. But I guess it was just to have him close.*

The partners did not intentionally share their emotions with the women, however the women were able to observe the emotions and reactions of their partners to the environment and the events taking place. Some women interpreted the demonstration of these emotions and reactions as a way that their partner was sharing their experience with them.

Kate recalled:

> *But I do know my husband had a really hard time because he didn't see me… when I came out, he didn't know what had happened. So I know that he went through a lot waiting because no one came out to say what was happening. It was a bit of a stressful time for him and I know he got very emotional and that with it.*

Sara describes her experience with her partner as:

> *I made him come to that appointment in the hopes that he would open up about what he was feeling, because the doctor brought up trauma … And he didn't say anything and I said to him, "Do you want to talk or do you want to say anything?" and he said no. So I think it's probably too early days for him at the moment, I think he'll probably sit on it for a while … because the other day, we were talking about it and he looked away from me and I thought I could see that sadness in his eyes and that fear.*

6.6.2 Being a Protector

The women in this study felt protected by their partners, using words related to strength to describe them as emotional, involved, vulnerable and attached. Their words create visual pictures of physical and emotional aspects of being a protector.

Kate describes how she interpreted her partner's protective actions to ensure she received the care he thought she needed as being derived from his personal qualities:

> *I said to my mum, "This is good, I have an assertive husband."*

While Sara's description creates a focus on the physical attributes of protection, describing her partner's reactions:

> *I have to really push to talk to him and get things out of him that he's felt, how he felt about it, because I know he was pretty frightened because while I was in theatre he told me that the nurses were coming in and out of theatre and just saying, "We don't know that she's going to make it, just be ready because it's looking pretty bad." So, I think he's carrying that burden as well.*

Sara describes how being able to see her partner's shoulders and back evoked a strong feeling of needing to be held by him. Sara description creates a visual picture of his body proving physical and emotional protection.

> *…the first thing I saw was my partner come over with the baby and he was just telling me about her size and all that sort of stuff. And I remember looking over the back of his shoulder. The first thing I wanted to do really I just tried to grab him and just bring him down to me and I wanted to hug him and I wanted to tell him what I felt when we were in the ambulance because that was the scariest thing was knowing that I was almost dying but I couldn't verbalise. I still couldn't talk.*

Kate describes how even though she felt conflicted at the time, she felt protected and safe when her partner was attempting to negotiate her care and take control of her care to initiate her transfer to another facility for ongoing care. Her admiration for her partner's strength during this time was described during her interview.

> *I cried and cried, every time he spoke to the doctors I was crying because I felt like it was a conflict but he was only trying to do it to protect the baby and me and he just wanted us together.*

Jessica and Jackie describe their partnership with their respective husbands as being a protector during their experience. Jessica recounted:

> *so that was really nice to have his support … I guess it's hard when you're used to doing everything yourself you find yourself in a situation where you're helpless, you can't even sit up to get your own baby, so it's hard, I'm very lucky that I have someone who wants to partake and takes an interest that I can just heal and not feel stressed out.*

While Jackie's partner did not arrive at the hospital in time for the birth of their premature baby, he was constant by Jackie's side during the many weeks their baby received care in the neonatal unit. Jackie described recalled a conversation with her partner:

> *I said to him, "Why did it happen? Why did this thing happen to us?" And he said to me something beautiful, it was, "That's to make it stronger - our relationship" and it's true. It's something unique, something that we are living and something that we are partnered together so it's something to make us strong, stronger in our relationship I think.*

The traditional view of the Australian male is one off being protective in detached way. Sara described how she perceived the effect of her partner being a protector:

> *I think he wants to be the strong person and be the one that looks like they're coping with it all and they probably aren't. He would rather bottle things up inside and be real staunch about it than talk about it and deal with it because they're afraid of the emotion that comes with it, he's afraid of facing that emotion and feeling it… like he doesn't want to reach the point where it's sitting in your throat and you just want to cry about it.*

6.7 Chapter Summary

In this chapter, the identified themes from the data analysis 'responding to the situation', 'being separated from the baby' and 'being a supportive partner' have been explored through the sub-

themes of each theme using the words of the women who participated in this study. Each woman's context and the events surrounding their admission to ICU have been described.

The following chapter merges the findings of this chapter with the quantitative findings described in Chapters five and draws on the literature to offer insight into women's experience of severe maternal complications and admission to ICU during pregnancy or in the postnatal period.

Chapter 7 The case

7.1 Introduction

The purpose of this case study was to describe the outcomes and impact of an ICU admission for severe maternal complication during pregnancy or the birth period. The hypothesis for the study was that the experience of women with severe maternal complications resulting in admission to ICU during pregnancy or birth, impacts on their health and wellbeing.

The theoretical lens of critical social science was adopted together with a woman centred approach to care. A woman centred care approach refers to a model of care where what is important to the woman is valued and is the driver of her health care. This model of care places the responsibility for care onto the woman to identify, articulate and negotiate her needs to her care provider (Page, 2003). The application of this care approach to the research processes enabled the women who participated in this study to tell their story their way.

The outcomes of the women's experience were interpreted through the collection of quantitative data about the health and wellbeing of each woman soon after birth and at approximately six weeks after she had given birth to her baby. In addition, understanding the impact of the women's experience was gained through analysis of the story of five women generated through individual interviews conducted by the researcher with each woman. Three themes were identified: responding to the situation, being separated from the baby and being a supportive partner.

This chapter merges the qualitative and quantitative findings described in Chapters five and six of this thesis and draws on the literature to offer insight into women's experience of severe maternal complications and admission to ICU during pregnancy or in the postnatal period. Each identified theme will be addressed. Statistically significant findings identified during analysis of the quantitative data will be aligned to the themes, as relevant, to explain the finding. An integrated discussion will situate each finding within the existing literature.

7.2 Being a supportive partner

The key finding of this study is that the presence of the woman's partner throughout her experience of an ICU admission was the most significant aspect of her experience. The women's discussion about the actions and behaviours of their male partner demonstrated that while each partner's response to the situation was different, their presence was important to the woman regardless of the response. When compared with the published literature about the response of male partners in hospital birth settings during normal birth or caesarean section (Eriksson, Salander, & Hamberg, 2007; Erlandsson & Lindgren, 2009; Fenwick, Bayes, & Johansson, 2012; Hildingsson, Johansson, Fenwick, Haines, & Rubertsson, 2014; Johansson, Rubertsson, Rådestad, & Hildingsson, 2012; Lindberg & Engström, 2013; Souza, Cecatti, Parpinelli, Krupa, & Osis, 2009) the actions and behaviours of the male partners described by the women in this study were similar.

The presence of the woman's partner at childbirth has been an accepted norm in western society since the 1960s (Hildingsson, Cederlöf, & Widén, 2011). The partner's role during labour and birth

is often regarded by health professionals as one of physical support such as wiping and sponging his partner throughout the labour and hand holding for emotional support. Women, however, deem emotional expressions of caring, empathy and sympathy to be important to them and consider partners to be their most important support (Somers-Smith, 1999; Widarsson et al., 2012).

The women interviewed during this study described how their partner was not only a physical presence for them but also was a protector of them and their baby (Erlandsson & Lindgren, 2009). The male partners undertook actions and activities that each woman perceived to have contributed to her and her baby's health and wellbeing. These actions included advocacy for her, physical care of herself and their baby and assuming responsibility for her care when she was unable to make her own decisions. This behaviour is similar to the way men described their role at normal birth where they saw themselves as general support and being there, rather than being present to undertake specific tasks (Somers-Smith, 1999).

Partners perceived themselves as an active member of the woman's support team during labour and birth and wanted to be involved in their partners care (Steen, Downe, Bamford, & Edozien, 2012). Eriksson et al. (2007) argue that the intensity of male partner activity during labour and birth is related to their desire to contribute to care and may reflect the stress the men feel about their role or their situation in the birthing room. These stresses are described by a number of authors as being demonstrated through overwhelming emotion and fear, heightened when they perceive their partner to be frightened or vulnerable (Fenwick et al., 2012; Johansson, Hildingsson, & Fenwick, 2013; Somers-Smith, 1999). The women described the male partners in this study as being fearful, or demonstrating signs of being fearful during their experience. Some women reported how their male partners articulated their feelings of fear to them, while other women discussed how their partner's

behaviours may have been an indication of how fearful or stressed they were. For example, one of the male partners in this study was criticised by his partner because of his propensity for endless chatter that created noise she felt was unnecessary during their experience. She felt this behaviour demonstrated his fear as it was out of character for him suggesting that he did not have the linguistic skills to articulate how he was feeling. Another woman described how she perceived her partner to be aggressive towards the medical staff when they attended her room for physical assessment and treatment planning. She felt this was his way of saying to staff that he feared for her wellbeing and demanding to be informed of her progress was his way of protecting her.

A Swedish study by Hildingsson et al. (2014) described how fear may influence the male partner's feelings that pregnancy and childbirth are uncontrollable and they are not able to influence the outcome. The women in this study explained how their male partners did not articulate their fear to the staff even when they (the partner) were experiencing extreme stress. Eriksson et al. (2007) asserted that this lack of action by male partners regarding their own stress and distress might be as a result of their perception that they may not receive any help from staff to manage their fear. Throughout the literature there is supporting discussion exploring how partners feel they are viewed by the health care team. These discussions have identified how partners struggle to be recognised by maternity health care providers as important to the woman's care regardless of the context of the care (Fenwick et al., 2012; Hildingsson et al., 2011; Hildingsson et al., 2014; Lindberg & Engström, 2013; Snowdon, Elbourne, Forsey, & Alfirevic, 2012; Steen et al., 2012). Male partners of the women in this study were described as feeling marginalised, invisible, sidelined and left out throughout the continuum of the maternity experience (Eriksson et al., 2007; Fenwick et al., 2012; Lindberg & Engström, 2013; Widarsson et al., 2012). These feelings were exacerbated when

complications occurred during labour as partners wanted to advocate strongly for their partner to their maternity care provider (Lindberg & Engström, 2013).

The experience of being excluded from care left the male partners unprepared for acute situations and ill-equipped to understand what was happening to their partner or to participate in decision making (Fenwick et al., 2012; Lindberg & Engström, 2013; Snowdon et al., 2012). Male partners, proffer Lindberg and Engström (2013), are left alone without instruction or support from staff during procedures they perceived to be necessary to save the life of their partner or unborn baby, relegated to a passive observer role and a low priority for staff. This was evidenced in this study where one woman stated she could not negotiate with her maternity care providers to consider waiting a few minutes for her partner to arrive in the operating theatre so he could be present for the birth of their baby, adding that there was no immediate threat to her life or to her unborn baby. Similarly, another woman in this study shared how her maternity care providers when discussing her condition and plan of care excluded her male partner. She stated he felt forced to draw on his knowledge of animal biology as a veterinarian to understand the complications she was experiencing to be able to advocate for her when she was unable to do so.

Subjective experiences of fear, helplessness and lack of control during birth are reported to effect the male partner's adjustment to his new role as a father and attachment to their newborn baby (Fenwick et al., 2012; Zerach & Magal, 2017). These experiences contributed to anxiety and negative birth experiences of male partners (Zerach & Magal, 2017). Furthermore, research by Iles, Slade, and Spiby (2011) found men's early distress in response to traumatic birth experiences may prevent them from providing the support the woman requires to begin to understand her experience and begin her recovery.

While this study did not expressly record the experience of male partners, the experience of the woman's partner was influential to her own experience. The women clearly described how they interpreted their partner's anxiety as contributing to their own stress and anxiety. Even though their shared stress and anxiety was viewed by the women as an important aspect of their relationship, the women described how they felt they needed to address their own physical and emotional health before they could assist their partner.

7.3 Responding to the situation

The second key finding is the women who were admitted to ICU in this study experienced ongoing anxiety without depression during the postnatal period. While each woman's experience of pregnancy and birth was highly individualised (Ayers et al., 2015), the response of each woman to her situation had similarities. As described in Chapter one, when pathophysiological processes occur, the predictability of the physiological process may be negated and the woman's physical condition can alter drastically within minutes. Sometimes, the woman's life will be at risk. When this situation occurs, women ask themselves why such a catastrophic event happened to them (Furuta, Sandall, & Bick, 2014). As an admission to the ICU will be the result of a catastrophic event, it was important to understand how women respond to these rare situations.

Each woman in this study described anxiety as a response to her situation. While up to twenty percent of women describe labour and birth as traumatic (Ayers et al., 2015; Soet, Brack, & DiIorio, 2003), it was the subjective experience of when a woman feels her life was threatened that was

central to the development of stress symptoms, negative emotions and anxiety (Garthus-Niegel, von Soest, Vollrath, & Eberhard-Gran, 2013).Understanding their postpartum anxiety was important to understanding the overall response of the women to their experience. At subclinical levels increased anxiety in mothers, even when independent of depression, has been reported to be highly detrimental to the long term health of their children with outcomes of decreased breastfeeding, increased risk of child abuse, and delayed physical, cognitive and social development reported (Elmir et al., 2010; Lonstein, 2007).

Each woman described her feelings of being anxious during her experience. Commonly, her anxiety was directly related to the fear she felt about dying as she became aware of the gravity of her physical condition. The women articulated how they feared for their lives, and for the ongoing care of their baby without a mother. This phenomenon described as being between life and death by Elmir et al. (2012), was consistent with the limited literature available related to severe maternal complications. It has been reported that women who have had a near death experience around the time of birth focus their thoughts away from the events that were happening and to the impact their death would have on their family (Snowdon et al., 2012). Consistent with the available literature, some women described out of body experiences while other women reflected on their life, their history and their expectation for the future, with their depth of their anxiety commensurate with their perception of how close to death they were (Elmir et al., 2012; Furuta, Sandall, & Bick, 2014; Souza et al., 2009).

Higher levels of pain associated with birth trauma are recognised as a predictor for post- traumatic stress symptoms (Garthus-Niegel et al., 2013; Goutaudier, Séjourné, Rousset, Lami, & Chabrol, 2012; Soet et al.). When telling their story, the women in this study recalled painful procedures performed on them to save their lives. These procedures included surgical and obstetric interventions such as caesarean section and bimanual compression of the uterus to control obstetric haemorrhage. This study revealed the pain and physical function of the ICU women were not improved by the end of the postnatal period and they had more pain and physical dysfunction than healthy women. Interestingly, pain and physical function were not a feature of the discussion during the interviews from any of the women, rather it was mentioned as an inconvenience rather than a driver of their perception of their health status. This finding is in contrast with the published research where women who had experienced obstetric haemorrhage requiring hysterectomy reported that they experienced pain and flashbacks at twelve weeks after a birth requiring hysterectomy (Elmir et al., 2012). Elmir et al. (2012) contended these symptoms might be related to the woman's realisation and acceptance that she will never become pregnant or give birth again. The women in this study all retained their physical ability to become pregnant and give birth in the future. It is unknown if this was a protective factor against post-traumatic stress symptoms.

The birth of a baby requires substantial adjustment with physiological changes resulting from fluctuating and high levels of oxytocin and prolactin (Lonstein, 2007). These changes have been reported to cause fatigue and, for some new mothers, postpartum anxiety (Ayers et al., 2015; Heron, O'Connor, Evans, Golding, & Glover, 2004; Lonstein, 2007; Wenzel, Haugen, Jackson, & Brendle, 2005). Sleep and sleep disturbances can impact on a person's physical and emotional wellbeing and overall health (Carpenter & Andrykowski, 1998). Ayers et al. (2015) found that women who experienced traumatic births demonstrated hyperarousal symptoms, which include disturbances of

sleep quality, were also reported by women who experienced births they regarded as non-traumatic. While hyperarousal is demonstrated through increased vigilance of the newborn and sensitivity to the child's needs, these qualities are required to keep the baby safe (Ayers et al., 2015). Sleep disturbances were found to be common to all women involved in this study. While the women stated that they viewed their fatigue, sleep and quality of sleep as being similar to their previous experience as a new mother or their pre-pregnancy held expectations of being a new mother, the ICU women were found to experience more nocturnal sleep disturbance when compared to healthy women with healthy babies. Increased levels of ongoing pain and anxiety experienced by the ICU may contribute to poorer sleep.

The women in this study were all matter of fact about putting their experience behind them and moving on with their lives. While negative emotions are associated with post-traumatic stress symptoms (Garthus-Niegel et al., 2013; Goutaudier et al., 2012), the concept of personal growth is also discussed in the literature where women's responses to severe maternal complications have a positive impact on their lives, providing them with a sense of strength and purpose (Furuta, Sandall, & Bick, 2014; McKenzie-McHarg et al., 2015; Souza et al., 2009). The women in this study viewed their role as the mother to their baby positively. During the interviews, each woman was observed by the researcher to take pride in her efforts to establish breast feeding and demonstrate her mother-crafting skills (Elmir et al., 2010). The desire to be a successful mother to be linked to a desire to atone the traumatic birth for their babies while restoring their faith in their bodies (C. T. Beck & Watson, 2008).

7.4 Being separated from the baby

The women admitted to ICU in this study reported that meeting their baby for the first time was remembered as being a very special time, unlike any other experience (Redshaw, Hennegan, & Kruske, 2014). It is reported behaviours exhibited by the mother and baby at birth promote the maintenance of the physical closeness established during pregnancy and support initiation of lactation (Fernandez et al., 2013). Healthy term infant behaviours to promote this closeness are described to include movements and crying to attract the mother's attention, while maternal behaviours in response to these actions have been observed to be touching, gentle stroking and quiet talking to her newborn infant (Bayes, Fenwick, & Hauck; Nonnenmacher, Noe, Ehrenthal, & Reck, 2016). These actions are deemed important for the transitional physiological state of full term infants, promoting stabilisation of respiration, oxygenation and temperature control required for survival (Alhusen et al., 2013; Bosch, 2011; Nonnenmacher et al., 2016; Redshaw et al., 2014). The maternal response is equally important to the promotion of positive feelings of wellbeing and emotional warmth within the woman and for breastfeeding (Nonnenmacher et al., 2016; Redshaw et al., 2014).

Separation of the infant from its mother has been found to be highly stressful to the infant, leading to behaviours such as crying cycles to attract their mothers attention to re-establish contact with her (Fernandez et al., 2013). For women, separation from their baby is stressful (Bosch, 2011; Fenwick, Barclay, & Schmied, 2008; Hinton et al., 2015). Bayes et al. (2012) found that new mothers want to hold their baby in their arms at birth. This longing has been found to occur regardless of the method of birth with physical contact with their baby at birth an important factor in positive mood and reduced anxiety even in the absence of breastfeeding (Bayes et al., 2012; Lonstein, 2007).

The outcomes of separation at birth may influence the long term relationship between the mother and her infant and the emotional development of the infant throughout its life (Wenzel et al., 2005). Bayes et al. (2012) explained how women who had been separated from their newborn baby following caesarean section felt disengaged and indifferent about re-establishing contact with their newborn infant even if they were separated for a short period of time. However, the women in this study clearly articulated their desire to hold and know their newborn infant was not tempered by previous meetings with their baby. Indeed, their desire to have their baby with them and provide care for their baby became stronger as time passed. Consistent with the findings of Hinton et al. (2015) the women in this study wanted to be a mother to their newborn baby. Even when they were close to death, the women's thoughts were with their baby with their anxiety more closely linked to their concern about their newborn infant than for their own condition.

Bayes et al. (2012) also reported how women described the space between birth and meeting their newborn baby for the first time following separation at caesarean section as "missing" (p.e905). Fenwick et al. (2008) found mothers separated from their baby through admission to the neonatal unit described similar feelings of "just existing" (p.80) and being detached while they waited to take on the role of mothering. Similarly, the women in this study described how they felt detached from their surroundings while they waited to meet and spend time with their newborn baby. The women described their anxiety about the 'lost' time delaying the creation of their history with their newborn baby. Some women described how they questioned whether they were mothers or that their baby had been born, as they were cared for in the ICU without their baby. The description of the women's experience in this study paints a picture of waiting with anticipation, suspended in time and place.

7.5 Midwives, nurses, and critical care

The word midwife means ‘with woman’ and is universally associated with advocacy, warmth and caring (International Confederation of Midwives [ICM], 2011). Throughout the discussion in this thesis, language commonly not associated with warmth or caring including isolation, detachment, separation and anxiety, was used by women to describe how they were feeling. Monk (2013) noted there has been a shift in language describing becoming a mother with a move from excitement and anticipation to one of crisis requiring a cure. To promote understanding of this shift, an examination of the evolution of contemporary midwifery that has influenced current education and practices in Australia is presented.

The scope of practice of Australian midwives determined by the Australian Nursing and Midwifery Board of Australia, has adopted the international definition of a midwife (ICM, 2011). The language of the definition of an Australian midwife includes promotion of health, health advocacy and preventative care with instruction about consultation when intervention is required (Nursing and Midwifery Board of Australia [NMBA], 2006). Using this definition, Australian midwives have reclaimed their professional identity with an emphasis on promotion of normal birth as a natural process that should not be interfered with (Hildingsson et al., 2016). McIntyre et al. (2012) argue this discourse has been used to separate normal birth from the obstetric paradigm. However, Lane (2012) claim the obstetric paradigm is defined by identification of obstetric risk, created by obstetrics, in the development of technology and interventions designed to quantify what is normal. Caught in the cross fire is the woman, who has limited options to access maternity care that is not

organised in a biomedical model of risk assessment, disease management and complications even when the risk is very low (Coxon, Homer, Bisits, Sandall, & Bick, 2016; Sidebotham et al., 2015).

The re-emergence of midwifery as a profession has been driven by clarity of midwifery philosophy and consumer demand for new models of care (Hammond, Gray, Smith, & Fenwick, 2011). While midwifery as a postgraduate nursing course transitioned to the tertiary education sector from a hospital based apprenticeship style of training during the 1990s, it was the introduction of an undergraduate midwifery degree in 2002 that enabled midwifery to become a discreet profession (McKellar & Graham, 2017). The initial purpose of the implementation of undergraduate midwifery programs was to address the nationwide shortage of midwives through a cost effective and timely program of midwifery education (Tracy, Barclay, & Brodie, 2000). The 'follow thorough' or 'continuity of care' experience as a model of clinical practice learning was introduced as an innovation in midwifery education and remains central to the educational preparation of midwifery students. Described as a 'placement with women' (Gray, Leap, Sheehy, & Homer, 2013) the introduction of the follow through experience was intended to ensure that midwifery students experienced clinical practice in community settings in addition to the hospital setting. Furthermore, education provider commitment to continuity of care experiences within curricula promoted understanding of the benefits of primary health principles and woman centred care to maternal and neonatal outcomes (Sidebotham et al., 2015). The positive response from women to student continuity of care experiences as a learning tool (Gray et al., 2013; McKinnon et al., 2014; Tierney, Sweet, Houston, & Ebert, 2016) and to continuity of care models in practice (McKinnon et al., 2014) supports the underpinning midwifery philosophy of woman centred care (Ebert, Tierney, & Jones, 2016; Tierney et al., 2016).

As midwives are now entering the profession through direct educational routes from curricula focused on primary health care principles (Sidebotham et al., 2015), Bench and Fitzpatrick (2007) argue there is potential for concern about the recognition and management of critical illness. McCarthy, Nuttall, Smith, and Martin (2014) describe how with limited opportunity to learn about ill health in an undergraduate curriculum focussed on the expectation that the childbirth continuum is low risk, midwives may be inexperienced in recognising and managing acute ill health. However, Gray et al. (2013) contend that the continuity of care experience provides situated learning in the real world where midwifery students are providing care to pregnant women with increasingly complex needs and co-morbidities within collaborative models of care (McCarthy et al., 2014). While midwives are reported to describe feeling anxious when faced with critical illness management, Bench and Fitzpatrick (2007) found that midwives do have ability to identify signs of critical illness contending that they have knowledge required to recognise deterioration and implement appropriate action.

Simulated learning in management of obstetric emergencies, resuscitation and stabilisation of the newborn is a key educational strategy for the development of clinical skills of midwives and midwifery students (Cooper et al., 2012). Evaluation of simulated learning in obstetric emergency management demonstrates there is transferability of learning to clinical practice including to the critical care context (Barry, Noonan, Bradshaw, & Murphy-Tighe, 2012). These skills include communication, teamwork and decision making (Cooper et al., 2012), maintaining ongoing assessment, being alert to the needs of the woman and initiating timely intervention (Hoover & Holt, 2016). While these skills are recognisable as being essential to critical care, midwives without nurse training feel they do not have the skills to manage critically ill women with some feeling that care of

the critically ill woman is outside of their belief about the purpose of midwifery care (Bench & Fitzpatrick, 2007).

Extensive clinical experience of caring for maternity women in the ICU in Australia is uncommon (Crozier & Wallace, 2011). Typically, pregnant, or postnatal women requiring intensive or critical care will be admitted to a general ICU and receive their care from nurses who are not midwives (Bayes & Ewens, 2016). McCarthy et al. (2014) argue even though Registered Nurses have completed nurse education and are regularly exposed to ill health, they are underprepared to care for people requiring critical care. The ICU nurses are reported to experience apprehension and stress when required to care for pregnant or postnatal women (Bayes & Ewens, 2016; Bench & Fitzpatrick, 2007). They feel caring for these women is risky as they feel they do not have understanding of the physiology of pregnancy or the pathophysiological processes affecting the pregnant woman and her fetus to support their practice (Pollock, 2006). Kynoch et al. (2010) maintained that some nurses are unable to translate existing skills from their general practice to the maternity context because they are unfamiliar with this context of care. Furthermore, there is limited opportunity for ICU nurses to gain confidence and competence in caring for critically ill pregnant and postnatal women as a result of limited clinical exposure and no formalised educational programs available for postgraduate study in maternity care outside of a formal midwifery program (Engström & Lindberg, 2013; Kynoch et al., 2010). As little support and minimal guidance is available for nurses caring for critically ill pregnant and birthing women (Hinton et al., 2015), there is an identified need educational programs for nurses working in critical care (Hinton et al., 2015; Kynoch et al., 2010).

7.6 Chapter Summary

In this chapter, the key findings of this research have been presented. Qualitative and quantitative data have been integrated to describe the case of the impact and outcomes of an ICU admission during pregnancy or birth. The relationship between midwives, nurses and critical care was explored to explain how the current philosophy of midwifery has evolved and how this impacts on care when pregnant and birthing women require care in the ICU.

The next and final chapter of this thesis will describe recommendations for practice drawn from the findings and discussion of the research. The strengths and limitations of the study will be described with this researcher's actions to enhance rigour throughout this research outlined prior to final conclusions drawn.

Chapter 8 Conclusion

8.1 Introduction

The final chapter of this thesis commences with a short reflection on this study. This reflection provides insight into the researcher's learning throughout this study. The strengths and limitations of the study will be identified followed by steps taken by the researcher to ensure rigour and quality in the research process. Recommendations will be made under the domains of practice, education and research before final conclusions are drawn.

8.2 Researcher's reflections

This thesis opened with a prologue of the story of Sally, a mother, an ICU nurse, a midwife and a colleague, who experienced an ICU admission during her second pregnancy. Her desire and willingness to tell her story prompted this study. As a nurse and midwife of more than thirty years, I had experienced caring for my share of critically ill people, many of them women with severe complications during pregnancy and birth and, often, they were an inpatient in ICU. While I had speculated on recovery of the women after they had been discharged from hospital, I never felt the desire to explore their experience any more deeply than a passing thought. However, this changed when the experience became personal and our beautiful staff member required the highest levels of health care available to save her life and the life of her unborn baby.

As a midwife with extensive experience in maternity reform, I espouse woman centred care (or I thought I did). The choice of a woman centred lens to focus the research process seemed like an easy approach to take; after all I was the expert (or so I thought). How wrong I was! During this research, I learned that a woman centred lens means much more than meeting the woman somewhere along the continuum of care line to plan her care. The women taught me they were the experts in their experience and how to totally hand over the responsibility for their experience to them. I learned this early in the recruiting process when staff would ask me to recruit a woman who met the criteria. Often the staff would comment that they thought it would be good for the woman to join the study as there were limited follow up opportunities available to the women. Equally often, the woman would not consent to join the study. When a woman did consent to join the study, I was entirely in her hands in relation to the information she would share and how she shared it. This contrasted with my previous experience where the health care professional usually held the cards related to health care. These cards contained the information and the expertise the woman needed to access or restore her health. Throughout this study, the table was turned, the woman held the cards. She held the story, the information, and the expertise I required. It was a truly humbling experience.

The women have been heartfelt, honest, and at times brutal when telling their stories. Their stories have sustained me throughout this study. They entrusted their stories to me and I promised each woman that I would honour their story. This thesis is their story.

8.3 Strengths of the study

There were a number of strengths to this study that supported the research process from inception to the end. The case study methodology and design was one strength of this study. This methodology enabled an in depth examination and description of the experience of the women in the study (Creswell, 2013). With a focus on the answers to the research questions rather than the questions themselves, the methodology provided flexibility to modify the method as the case evolved (Yin, 2014). The collection of quantitative and qualitative data using multiple methods enabled the multi-dimensional story of the women to be told. In the analysis of the stories, the quantitative data results confirmed the findings of the qualitative data, thus verifying the findings of each method. Furthermore, the study design of data collection over two time points and across two groups enabled the case to be built in layers, reflecting the experience of the women as a multi-layered phenomenon.

The research topic was another strength to this study. As identified in the literature review (Chapter two) and in the discussion chapter (Chapter seven) there is limited published data exploring the experience of women requiring ICU admission during pregnancy or birth. This is the first study examining this phenomenon at this study site. While the study was conducted within the maternity service, the intensive care unit staff were willing partners. Research in high-risk areas of health and with vulnerable populations is difficult to undertake. The ethical approval process can be demanding and time consuming. In this study, the ethical approval process providing guidance to the researcher and the research process while protecting the women who could potentially join the study supported the topic.

The researcher's clinical background as a midwife and a nurse at the study site for more than thirty years was the final strength of the study. My experience provided deep understanding of the context of the care and the holistic needs of women and their families receiving care. The researcher was well known to clinicians across the multidisciplinary teams within the maternity and intensive care units. This familiarity may have provided more opportunity for engagement and commitment to the research process across the health disciplines and clinical units, particularly when study protocol changes were required as the research process evolved.

8.4 Limitations to the study

Just as there were strengths to this study, there were also limitations that must be considered in the interpretation of the research findings. The main limitation of this study was the recruitment of women to this study. Australia has one of the safest maternity care systems in the world and the demand for ICU admission during pregnancy and birth is low (Crozier & Wallace, 2011; Kynoch et al., 2010). The rarity of severe maternal complications requiring the woman to be admitted to the ICU at the study site, reduced opportunity for recruitment to the study. Recruitment opportunities were further reduced during the study as changing demand for ventilator beds at the study site led to modification of ICU admission protocols. This resulted in higher thresholds to ICU for admission. Commonly, this threshold was mechanical ventilation. Consequently, during the later stages of this study, women who previously would have been admitted to ICU were cared for under a 'special care' protocol in a ward area or the birth suite.

Rural and remote women are underrepresented in the study. The medical record audit results described in Chapter four, revealed that more than fifty percent of women admitted to ICU at the study site reside outside the birthing catchment area of the study site. No women who participated in phase one of the study and resided outside of the birthing catchment area could be contacted to complete the second phase of data collection. Each of these women had been transferred back to their home hospital for ongoing care with no follow up care planned at the study site. While it is unknown why these women were not contactable; it could be argued this response could be reflective of poorer access to limited health resources and services available in rural areas of North Queensland (Francis & Chapman, 2011). An alternative argument may be that this response is reflective of the one of the findings of the study. Women drew a 'line in the sand,' put the experience behind them and moved on with their life. However, these alternating explanations are purely speculative.

The small numbers in this study limit the interpretation of the statistical differences between the ICU women group and the healthy women group described in this thesis. While non-parametric testing was conducted as the most appropriate method to explore the variables of the two groups, regression analysis to describe the inherent differences between the two groups was not undertaken.

8.5 Quality and rigour

Quality and rigour across the length and breadth of this study was integral to the ongoing conduct of the study and was demonstrated throughout this research. The ethical processes, designed to protect the public from harmful research conduct were central to the maintenance of the research quality

and rigour. This study retained continuous external Human Research Ethics Committee (HREC) approval with multiple health service site specific approvals (SSA) from its inception with this approval continuing throughout the preparation of this thesis. Under this approval, every aspect of the study design, methodology, research process and data analysis has been under continuous external review with regular reporting to the external HREC.

Yin (2014) argues that as case study research is part of the larger social science research picture, tests commonly used to establish the validation and reliability of empirical social research are relevant to case study research. Creswell (2013) contends writers of qualitative research have identified equivalent approaches to quantitative methods of data validation with several perspectives described in the qualitative literature. Language commonly used in relation to trustworthiness in the research process such as credibility, authenticity, transferability, dependability, and confirmability are asserted by Creswell (2013) to be a naturalistic perspective, while the more traditional quantitative approach to validation concepts such as internal validation, external validation, reliability, and objectivity are used.

The rigour of case study research is often questioned due to its pragmatic methodological approach of adaptability as the case evolves (Yin, 2014). This is commonly interpreted as lack of discipline in the research process (Creswell, 2013; Yin, 2014). However, Cresswell (2013) asserts that researchers' understanding of their topic, documentation of their research process, situating their research and self-reflection is contended to be substantive validation of the work. The tests of construct validity, external validity and reliability are applied to this research ensuring the emphasis of assessment of quality and rigour remains on the research process (Creswell, 2013).

The first test applied to this study was construct validity, which involves identifying correct operational measures for the concept being studied. The operational procedures in this study as described in Chapter four (Methods) included multiple methods of evidence collected to inform the research to form a chain of evidence. This chain of evidence is reported in Chapter 5 (Quantitative Data - Outcomes) and Chapter six (Qualitative Data – Impacts) forming the case report in Chapter seven. Ongoing review by the supervisory team throughout the data analysis and reporting of the findings ensured the truth of the findings was told.

The second test applied to assess rigour and quality was external validity. This is assessed in relation to the generalisation of the findings to the wider population and beyond this study (Yin, 2014). The study aimed to describe a specific human experience. The research questions provided the vehicle to seek this information. The research questions as demonstrated in Chapter one were formed asking 'how' thus inviting descriptive discussion about the experience. Analysis of the data in Chapters five and six provide rich descriptions of the experience of women experiencing severe maternal complications during pregnancy or birth. As the human experience is complex with many variables influencing the experience, the research design aimed to control these variables through the boundaries of the case and recruitment procedures. The findings, as described in Chapters five and six, and integrated in Chapter seven explain the experience as a whole and multi-dimensional experience. The integrated description of the women's experience is compared to the published literature throughout the discussion to enable generalisation of the findings in relation to other related research that addresses similar research questions.

The third test of quality and rigour applied to this study is reliability. The objective of this research design was to ensure that the study could be replicated to attain the same findings and conclusions

(Yin, 2014). The study protocol was internally reviewed by the university and externally reviewed by the HREC prior to commencement of the study. Furthermore, Chapters four and five provide clear descriptions of the research design, data collection methods and data analysis processes establishing an identifiable chain of evidence to promote replication of the study.

8.6 Recommendations

8.6.1 Recommendation 1: Midwifery Practice

The first recommendation from this study is that existing midwifery models of care at the study site be modified to enable access for women with severe maternal complications requiring admission to the ICU during pregnancy and birth.

Maternity reform in Australia has promoted improved access to new models of care resulting in access to continuity of midwifery-led care for some women. However, as identified in Chapter seven, implementation of these models has not been universal within health services or widespread across local, state or national health services. Additionally, continuity of midwifery care models are rarely established for women with serious maternal complications during pregnancy and birth to access (Homer, 2016) with no access to these models available at the study site for those women who met the criteria for this research project. This research found the health and wellbeing of the ICU women who participated in this study is impacted by their experience with poorer outcomes at six weeks after birth.

Midwifery care is proven to improve outcomes for women across the continuum of care with increased satisfaction for the woman (Fahy, 2012; McKinnon et al., 2014). Caseload models of

midwifery-led care are well established at the study site for women who meet the current criteria for admission including an all risk model. As the first point of contact for the midwifery-led models occurs during the antenatal period, a minor modification of the admission criteria to the all-risk model at the study site would enable a referral to a caseload midwife at the time of admission to ICU. This midwife would then be able to follow the women through the postnatal period to six weeks providing midwifery care to her and her family according to their needs. The ongoing nature of the therapeutic relationship throughout the postnatal period will provide the woman's partner with access to information about the health care they identify they need in their recovery from their experience.

An identified limitation of this study was the inability to follow up women who did not reside in the local area of the study site. This limitation identified that following discharge from the tertiary centre there is no handover of midwifery or nursing care from the tertiary health service to a named local nurse or midwife. The researcher's observation of study site regional health service nursing and midwifery organisational structure is that midwifery models of care are not commonly available in rural areas and the primary pathway for referral of mothers and babies is through the Child, Youth, and Family Health (CYFH) referral pathways. However, CYFH services are not universally available in rural areas of Queensland. It is recommended that the future development of any midwifery models of care in rural areas include flexibility to their admission criteria to enable midwives to follow women and their family throughout the postnatal period regardless of where they receive their birth care.

In Chapter seven of this thesis, it was identified that midwifery services remain primarily established within the acute care system under a medicalised model of care. While midwifery is now a separate

professional body to nursing in Australia (Nursing and Midwifery Board of Australia [NMBA], 2006), there has been no change to the career structure of midwifery which remains reflective of the nursing career structure. It is recommended in the development of any future midwifery career structure, the lack of access to midwifery services is the rural areas is recognised through the development of regional midwifery positions that have flexibility and capacity to provide follow up care to women and families throughout the postnatal period after they have returned to their local area.

8.6.2 Recommendation 2: Midwifery Education

The second recommendation from this study is that midwifery education curricula be inclusive of recognising the role others have in the care of the woman.

The word midwife literally means "with woman" (Page, 2003). In Chapter seven of this thesis it was established that the midwifery profession in Australia have adopted the International Confederation of Midwives philosophy of woman centred care. Thus, midwifery education in Australia is focused on preparing students to practice according to the international definition of a midwife with a lens of maintaining normality across the continuum of pregnancy, birth, and the postnatal period. Students are educationally prepared to develop their therapeutic relationship with the woman. The woman brings the support people of her choosing onto her journey to motherhood. The woman then provides her support people with the information and experiences she wants to share with them. Without curriculum support for students to engage with the woman's 'others' student may not learn how to engage with them.

As established in Chapter seven, the evidence that partners feel marginalised and left out of the maternity care experience by care providers is conclusive. The findings of this study indicate that when a woman is no longer able to advocate for herself, she hands this role over to her partner. However, this role is not well recognised or easily incorporated into the woman's care by midwives. Adjustments to the midwifery curricula to include the role of the partner in a woman's care will provide midwives with opportunity to learn this skill and b able to apply the skill across all maternity care settings

Midwives, including those who are also nurses, primarily choose to work in the maternity setting (Kingwell et al., 2017). Those who do work in dual roles are commonly located in rural areas where a multi-skilled workforce is required (Yates, Kelly, Lindsay, & Usher, 2013). Thus, there are few midwives choosing to work in the critical care environment. The majority of care for pregnant and birthing women admitted to the ICU is provided by nurses without a midwifery qualification who are reported to feel they have lack of competence to care for them (Kynoch et al., 2010). A review of the curriculum by the researcher of the main provider of undergraduate nursing education at the study site, found there was no maternity care component within the curriculum. Furthermore, a review by the researcher of the continuing professional development program for nurses and midwives at the study site found that maternity care education was restricted to midwives and obstetric medical staff. The researcher argues that nursing and midwifery education regarding maternity care is a silo model, restricted to those studying or working in midwifery. In Chapter seven the need for maternity care education to become available for Registered Nurses was identified and discussed. The recommendation from this study is that maternity care education that is within the scope of practice of a Registered Nurse should be available for Registered Nurses.

8.6.3 Recommendation 3: Midwifery Research

The third recommendation from this study is that further research exploring the care and recovery of women who experience severe maternal complications during pregnancy and birth is undertaken.

Further research is required into the experience of women with severe maternal complications during pregnancy and birth. The literature review providing the background for this study found the majority of published research relating to women experiencing severe maternal complications was primarily biomedical outcomes describing maternal morbidity and mortality and case based diagnostic and treatment discussion of specific medical conditions.

This research has identified more questions than it has answered indicating that better understanding of the woman's experience is required. This research explored a woman's experience at one point in time. The woman's experience prior to or after that point in time remains unknown. A longitudinal study would be beneficial to understand the impacts and outcomes on the long-term health and wellbeing of the woman and her family.

8.7 Conclusions to the study

This research has found the outcomes and impact of women admitted to the ICU for severe maternal complications during pregnancy are continuing anxiety, sleep disturbance and bodily pain affecting physical function at approximately six weeks after the birth of their baby. However, these responses are not recognised by the women as affecting them. The women in this study accepted that this

event happened to them and they were able to move on with their life. It is unknown how the women's recovery progressed past the sixth week after birth.

Finally, this research has demonstrated case study methodology to be a valid method of exploring the human condition and to promote understanding of complex life experiences. The study design has proven to be a method that is relevant and acceptable to women with severe maternal complications during pregnancy and birth.

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Appendices

Queensland Government

Queensland **Health**

TOWNSVILLE HEALTH SERVICE DISTRICT

Enquires to: Medical Administration
Telephone: 07 4433 1140
Facsimile: 07 4433 1051
Email: TSV-Ethics-Committee@health.qld.gov.au
File Number: Ethics – 11/QTHS/188
Our Reference: dbs/ethics/protocol/2011/11QTHS188_1

16 April 2012

Marie McAuliffe
63 Dearness Street
Garbutt
Townsville QLD, 4814

Dear Ms McAuliffe

HREC Reference number: HREC/11/QTHS/188
Project title: A mixed methods study of the experiences of women and/or their partner following an intensive care unit admission during pregnancy or in the postnatal period.
Protocol number:

Thank you for submitting a response to the committees concerns regarding the above mentioned study. At their meeting held 12 April 2012 the Townsville Human Research Ethics Committee reviewed and noted these responses and you are hereby ***granted ethical approval*** for the commencement of this study.

You and your research team are informed that Townsville Health Service District HREC approval at is subject to continuing conditions which require all researchers to comply with certain requirements throughout the duration of the research.

Specifically, these requirements are:
1. The Principal Investigator must complete an interim report at **six months, *annual report;* and final report.** Such reports are to address matters including:

a. The progress of the research or the outcome in the case of completed research;
b. The maintenance and security of data and records;
c. Demonstrated compliance with the approved protocol
d. Demonstrated compliance with any specific conditions of approval.

The initial report **MUST** be completed at six months after the approval date of this letter and every twelve months thereafter until the completion of the study.

2. The Principal Investigator will immediately report anything which might warrant review of ethical approval of the project in the specific format, including:
a. Unforeseen events that might affect continued ethical acceptability of the project.
b. Serious Adverse Events must be notified to the Committee as soon as possible. In addition the Investigator must provide a summary of the adverse events, in the specified format, including a comment as to suspected causality and whether changes are required to the Patient Information and Consent Form. In the case of Serious Adverse Events occurring at the local site, a full report is required from the Principal Investigator, including duration of the treatment and outcome of event.

3. Proposed changes to the research protocol, conduct of the research, or lengths of HREC approval will be provided to the HREC for review. The amended documents must be accompanied by a letter, signed by the Principal Investigator, providing a brief description of

the changes, the rationale for them and their implications for the ongoing conduct of the study. All amendments should be made on the Queensland Health online NEAF application and must contain revised version numbers, version dates and page numbers. Changes must be highlighted using Microsoft Word "Track Changes" or similar. Please contact the HREC Coordinator if assistance is required.

4. The HREC will be notified, giving reasons, if the project is discontinued at a site before the expected date of completion.

5. The Principal Investigator will provide an annual report to the HREC and at completion of the study in the specified format.

6. The District administration and the Human Research Ethics Committee may inquire into the conduct of any research or purported research, whether approved or not and regardless of the source of funding, being conducted on hospital premises or claiming any association with the Hospital; or which the Committee has approved if conducted outside Townsville Health Service District.

As indicated in your protocol submission, this study is scheduled to close on 30/06/2013. The study cannot continue after this date unless approval has been given to do so. If you require an extension to this date you must send in a written request to us with an explanation of the need for the extension

The HREC terms Reference, Standards Operating Procedures, membership and standard forms are available from the **http://www.health.qld.gov.au/cpic/ethics/reegu_homepage.asp** (http://www.health.qld.gov.au/cpic/ethics/reegu_homepage.asp).

Once authorisation to conduct the research has been granted, please complete the Commencement Form and return to the office of the Human Research Ethics Committee.

You are reminded that this letter constitutes ethical approval only. You must not commence this research project at a site until a separate authorization form, from the District CEO or delegate of that site has been obtained.

A copy of this approval must be submitted to the District Research Governance officer / Delegated Personnel with a completed Site Specific Assessment (SSA) Forms for authorization from the District CEO or delegate to conduct this research at the Townsville Hospital Health Service District.

Please ensure your HREC number is quoted in all correspondence to the Townsville Human Research Ethics Committee.

Please ensure the prefix for all contact numbers connected to the Townsville Hospital are updated to 4433****.

The HREC wishes you every success in your research.

Yours sincerely

K S Sangla

Dr Kunwarjit Sangla
Chairperson
Townsville Health Service District
Human Research Ethics Committee

Queensland Government

Queensland **Health**

TOWNSVILLE HOSPITAL AND HEALTH SERVICE

Enquires to: Naomi Mackee
Telephone: 07 4433 1022
Facsimile: 07 4433 2236
Email: TSV-RGO@health.qld.gov.au
File Number: **SSA/12/QTHS/102**
Our Reference: dbs/ethics/RGO/2012/102_1

Ms Marie McAuliffe
63 Dearness Street
Garbutt QLD 4814

Dear Ms McAuliffe

HREC reference number: HREC/11/QTHS/188
SSA reference number: SSA/12/QTHS/102
Project title: A mixed methods study of the experiences of women and /or their partners following an intensive care unit admission during pregnancy or in the postnatal period.
Protocol number:

Thank you for submitting an application for authorisation of this project. I am pleased to inform you that authorisation has been granted for this study to take place at the following site(s):

The Townsville Hospital

The following conditions apply to this research proposal. These are additional to those conditions imposed by the Human Research Ethics Committee that granted ethical approval.

1. As indicated in your protocol submission, this study is scheduled to close on 30 June 2014. The study cannot continue after this date unless approval has been given to do so. If you require an extension to this date you must send in a written request to us with an explanation of the need for the extension;

2. Proposed amendments to the research protocol or conduct of the research which may affect the ethical acceptability of the project are to be submitted to the HREC for review. A copy of the HREC approval/rejection letter must be submitted to the RGO;

3. Proposed amendments to the research protocol or conduct of the research which only affects the ongoing site acceptability of the project, are to be submitted to the research governance officer;

4. A proposed amendment to the research protocol or conduct of the research which may affect both the going ethical acceptability of the project and the site acceptability of the project are to be submitted firstly to the HREC for review and then to the research governance officer after a HREC decision is made.

Should you require any additional information, please do not hesitate in contacting myself on ☎ (07) 4433 1022.

Yours sincerely

Dr Andrew Johnson
Research Governance Officer
Townsville Hospital and Health Service
27/9/2012

JAMES COOK UNIVERSITY
AUSTRALIA

Townsville Campus
Townsville Qld 4811 Australia
Telephone (07) 4781 4111
International +61 7 4781 4111
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Dr. Anne Swinbourne
Chair, Human Ethics Research Committee
Telephone (07) 4781 4809
International +61 7 4781 4809
Facsimile (07) 4781 5521
Email: anne.swinbourne@jcu.edu.au

10 May 2012

Marie McAuliffe
63 Dearness Street
Garbutt, QLD
4814

Dear Ms Marie McAuliffe,

Re: **External HREC Approval HREC/11/QTHS/188**
A mixed methods study of the experiences of women and/or their partners following an intensive care admission during pregnancy or in the postnatal period.

The Chair of the Human Research Ethics Committee has reviewed the documentation and resolved that James Cook University acknowledges that this work has been conducted under the approval number listed above.

Please note that there must be no departure from the approved protocols and conditions of approval outlined in the above listed approval. Copies of any progress/annual reports to the Townsville Health Service District Ethics committee must also be provided to the James Cook University Ethics committee.

We have assigned a James Cook University approval number H4613. Please note these approvals expire 30th June 2013.

Thank you

Dr. Anne Swinbourne
Chair
Human Ethics Research Committee
James Cook University

11/QTHS/188_2
Human Research Ethics Committee
Medical Services Support Unit
07 4433 1140

Queensland
Government

Townsville
Hospital and Health Service

18th November 2013

Marie McAuliffe
63 Dearness Street
Garbutt
Townsville QLD, 4814

Dear Ms McAuliffe,

HREC Reference number: HREC/11/QTHS/188
Project title: A mixed methods study of the experiences of women and/or their partner following an intensive care unit admission during pregnancy or in the postnatal period.

Thank you for submitting an amendment for the above mentioned study on 29/10/2013. The correspondence was reviewed by the Chairperson on 18/11/2013

The documents reviewed and approved at the meeting were:

Document	Version	Date
Notification of amendment: *Addition of comparative participant group*		28.10.13
Participant Information Sheet – Comparative Group	1.0	25.10.13
Participant Consent Form (updated logo / header)	1.0	

The Townsville Hospital and Health Service HREC is constituted and operates in accordance with the National Health and Medical Research Council's "*National Statement on Ethical Conduct in Human Research (2007), NHMRC* and *Universities Australia Australian Code for the Responsible Conduct of Research (2007)* and the *"CPMP/ICH Note for Guidance on Good Clinical Practice"*.

A copy of this letter must be forwarded to the Townsville Hospital and Health Service Research Governance Office/r.

It should be noted that all requirements of the original approval still apply.

Yours sincerely,

A/Prof Andrew Johnson
Chairperson
Townsville Hospital and Health Service
Human Research Ethics Committee

11/QTHS/188_1
Human Research Ethics Committee
Medical Services Support Unit
07 4433 1140

Queensland Government

Townsville
Hospital and Health Service

20th September 2012

Marie McAuliffe
63 Dearness Street
Garbutt
Townsville QLD, 4814

Dear Ms McAuliffe,

HREC Reference number: HREC/11/QTHS/188
Project title: A mixed methods study of the experiences of women and/or their partner following an intensive care unit admission during pregnancy or in the postnatal period.

Thank you for advising us of the administrative error on your approval letter dated 16/04/2012. Please accept this letter as confirmation of your approval period.

HREC Approval is valid until 30/06/2014.

Yours sincerely,

A/Prof Andrew Johnson
Chairperson
Townsville Hospital and Health Service
Human Research Ethics Committee

Townsville Hospital and Health Service
Human Research Ethics Committee
Telephone +617 4433 1140
Email TSV-Ethics-Committee@health.qld.gov.au

HREC/14/QTHS/188_4
Human Research Ethics Committee
Townsville Hospital and Health Service
07 4433 1440

Queensland Government

Townsville
Hospital and Health Service

14th May 2014

Marie McAuliffe
63 Dearness Street
Garbutt
Townsville QLD, 4814

Dear Mrs McAuliffe

HREC Reference number: HREC/11/QTHS/188
Project title: A mixed methods study of the experiences of women and/or their partner following an intensive care unit admission during pregnancy or in the postnatal period.

Thank you for submitting an amendment for the above mentioned study on 07/05/2014. The correspondence was reviewed out of sessions by the Townsville Hospital and Health Service Human Research Ethics Committee Chairperson on 14/05/2014.

The amended documents reviewed and approved at the meeting were:

Document	Version	Date
Notification of amendment: *1. Extension for Ethical Approval until June 2015* *2. Additional Sites to the Study to include* *- Cairns Base Hospital* *- The Royal Brisbane and Women's Hospital* *- Brisbane Mater Adult Hospital* *3. Change of Supervision Team:* *- Assoc. Prof Lee Stewart to Principle Supervisor* *- Prof Kim Usher to Co-Supervisor*	1.0	07/05/2014
Cairns Base Hospital Participant Information Sheet	4.0	01/04/2014
Cairns Base Hospital Participant Consent Form	4.0	01/04/2014
Royal Brisbane and Women's Hospital Participant Information Sheet	1.0	07/05/2014
Royal Brisbane and Women's Hospital Participant Consent Form	1.0	07/05/2014
Brisbane Mater Adult Hospital Participant Information Sheet	1.0	07/05/2014
Brisbane Mater Adult Hospital Participant Consent Form	1.0	07/05/2014

The Townsville Hospital and Health Service HREC is constituted and operates in accordance with the National Health and Medical Research Council's "*National Statement on Ethical Conduct in Human Research (2007), NHMRC* and *Universities Australia Australian Code for the Responsible Conduct of Research (2007), Values and Ethics: Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research (2003)* and the *"CPMP/ICH Note for Guidance on Good Clinical Practice"*.

HREC/11/QTHS/188_6
Human Research Ethics Committee
Townsville Hospital and Health Service
07 4433 1440

Queensland Government

Townsville
Hospital and Health Service

21st July 2015

Marie McAuliffe
63 Dearness Street
Garbutt
Townsville QLD, 4814

Dear Mrs McAuliffe

HREC Reference number: HREC/11/QTHS/188
Project title: A mixed methods study of the experiences of women and/or their partner following an intensive care unit admission during pregnancy or in the postnatal period.

Thank you for submitting an amendment for the above mentioned study on 10/07/2015. The correspondence was reviewed out of session by the Townsville Hospital and Health Service Human Research Ethics Committee Chairperson on 21/07/2015.

The amended documents reviewed and approved at the meeting were:

Document	Version	Date
Notification of amendment: *Request for extension to 30/06/2017*		10.07.15
Annual Report		10.07.15

Please note the following key dates for this study:

HREC approval expiry: 30/06/2017
Annual report due: 09/01/2016

The Townsville Hospital and Health Service HREC is constituted and operates in accordance with the National Health and Medical Research Council's "*National Statement on Ethical Conduct in Human Research (2007), NHMRC* and *Universities Australia Australian Code for the Responsible Conduct of Research (2007), Values and Ethics: Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research (2003)* and the *"CPMP/ICH Note for Guidance on Good Clinical Practice"*.

Please notify the Research Governance Office/r at each site of the amendment, and provide a copy of this letter with a copy of the supporting documents as listed above.

It should be noted that all requirements of the original approval still apply.

Kind Regards,

Dr Nikola Stepanov
Chairperson
Townsville Hospital and Health Service
Human Research Ethics Committee

A Queensland Government

Townsville Hospital &Health Service

PARTICIPANT INFORMATION SHEET

Protocol Name: **A mixed methods study of the experiences of women following severe maternal morbidity during pregnancy or in the postnatal period.**

Researcher: **Marie McAuliffe, Doctor of Philosophy Student**

James Cook University

Information Sheet for Participants

Your severe illness during your pregnancy or postnatal period means that you have required more complex care than that which is able to be provided in the maternity ward. As very few women experience severe illness during their pregnancy or around the time of birth, little is known about how pregnant or women who have recently given birth recover from this experience.

As The Townsville Hospital is committed to improving the care that women and their families receive during pregnancy and birth, this study is being conducted to learn about your experience following your illness during your pregnancy or soon after your baby was born and your recovery during the first six weeks after the birth of your baby.

If you agree to participate in the study, you will be contacted by the researcher two times over the course of the study. The first time of contact will be soon after your have been transferred to the maternity unit, while you are still in hospital. The second contact is at six weeks after the birth of your baby. At each point of contact you will be asked to complete a series of questionnaires that will take approximately half an hour. At the second contact you will also be asked some questions about your experience and how you are feeling. This conversation will be audio taped and transcribed by the researcher.

It is possible that recalling the events that led to your severe illness and the events surrounding the birth of your baby may cause you distress. The researcher is a Registered Nurse and Midwife who has worked as a midwife in Queensland for almost 30 years. While the researcher will not provide you with any clinical care or advice on clinical matters at any time during the study, she will provide you with booklets and leaflets that may assist you to understand your stress. She will also give you information about health services that you may wish to access for assistance. These services include

the social workers in Women's and Children's Health at The Townsville Hospital and a psychologist who specializes in the mental health of mothers and families. Alternatively, you may wish to contact Child Health services based at Kirwan (Ph 47 99 9000) or a telephone counseling service such as Lifeline (Phone 131114)

- All information collected during the study will be confidential.
- Only the researcher and her research supervisors will have access to the information you provide.
- The researcher will not be accessing your medical record for any purpose.
- The information you provide will be kept in a locked filing cabinet in the researcher's office.
- The findings of the project will be published in professional journals and presented at conferences.
- Participation in the study is purely voluntary and you are free to withdraw at any time.

Thank you

CONTACT NAME: Marie McAuliffe

CONTACT TELEPHONE NO. 0407116894

This study has been reviewed and approved by the Townsville Health Service District Human Research Ethics Committee. Should you wish to discuss the study with someone not directly involved, particularly in relation to matters concerning policies, information about the conduct of the study or your rights as a participant; or should you wish to make an independent complaint you can contact the Chairperson, Townsville Health Service District Human Research Ethics Committee via email at TSV-Ethics-Committee@health.qld.gov.au or telephone (07) 4433 1140.

INVESTIGATOR CONTACT NAME: **Marie McAuliffe**

INVESTIGATOR CONTACT TELEPHONE NO. **0407116894**

DATED:

SIGNATURE OF CONTACT INVESTIGATOR:

Queensland Government

Townsville Hospital &Health Service

PARTICIPANT CONSENT FORM

Protocol Name: **A mixed methods study of the experiences of women following severe maternal morbidity during pregnancy or in the postnatal period.**

Researcher: **Marie McAuliffe, Doctor of Philosophy Student**

James Cook University

1. The nature and purpose of the research project has been explained to me. I understand it, and agree to take part.

2. I have been given an Information Sheet which explains the purpose of the research, the possible benefits, and the possible risks.

3. I understand that I may not directly benefit from taking part in the research.

4. I understand that, while information gained during the research may be published, I will not be identified and my personal results will remain confidential.

5. I understand that I can withdraw from the research at any stage and that it will not affect my medical care, now or in the future.

6. I understand the statement concerning payment to me for taking part in this research, which is contained in the Information Sheet.

7. I have had the opportunity to discuss taking part in this research with a family member or friend.

NAME OF Person:

SIGNED:

DATED:

I certify that I have explained the research to the volunteer and consider that he/she understands what is involved.

PROTOCOL NAME: **A mixed methods study of the experiences of women following severe maternal morbidity during pregnancy or in the postnatal period.**

SIGNATURE OF INVESTIGATOR:

Name _____

Date _____

EDINBURGH POSTNATAL DEPRESSION SCALE

Please indicate which of the following comes closest to how you have felt **in the past week.**

1. **I have been able to laugh and see the funny side of things**
   - As much as I always could
   - Not quite so much now
   - Definitely not so much now
   - Not at all.

2. **I have looked forward with enjoyment to things**
   - As much as I ever did
   - Rather less than I used to
   - Definitely less than I used to
   - Hardly at all

3. **I have blamed myself unnecessarily when things went wrong**
   - Yes, most of the time
   - Yes, some of the time
   - Not very often
   - No, never

4. **I have been anxious or worried for no good reason**
   - No, not at all
   - Hardly ever
   - Yes, sometimes
   - Yes, very often

5. **I have felt scared or panicky for no very good reason**
   - Yes, quite a lot
   - Yes, sometimes
   - No, not much
   - No, not at all

6. **Things have been getting on top of me**
   - Yes, most of the time I haven't been able to cope at all
   - Yes, sometimes I haven't been coping as well as usual
   - No, most of the time I have coped quite well
   - No, I have been coping as well as ever

7. **I have been so unhappy that I have had difficulty sleeping**
   - Yes, most of the time
   - Yes, sometimes
   - Not very often
   - No, not at all

8. **I have felt sad or miserable**
   - Yes, most of the time
   - Yes, quite often
   - Not very often
   - No, not at all

9. **I have been so unhappy that I have been crying**
   - Yes, most of the time
   - Yes, quite often
   - Only occasionally
   - No, never

10. **The thought of harming myself has occurred to me**
    - Yes, quite often
    - Sometimes
    - Hardly ever
    - Never

Total: _____

1

1. Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. British Journal of Psychiatry 150:782-78
2. Source: K. L. Wisner, B. L. Parry, C. M. Piontek, 2002 Postpartum Depression N Engl J Med vol. 347, No 3, 194-199

Name _____ **Date** _____

SHORT FORM-36 (SF36) SURVEY

Please answer the following questions about your health. Select **ONLY ONE ANSWER** for each question.

1. In general, would you say your health is:
   1. Excellent
   2. Very Good
   3. Good
   4. Fair
   5. Poor

2. Compared to one year ago, how would you rate your health in general now?
   1. Much better now than one year ago
   2. Somewhat better now than one year ago
   3. About the same as one year ago
   4. Somewhat worse now than one year ago
   5. Much worse than one year ago

3. Does your health now limit you in this activity? If so, how much? Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

4. Does your health now limit you in this activity? If so, how much? Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

5. Does your health now limit you in this activity? If so, how much? Lifting or carrying groceries.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

6. Does your health now limit you in this activity? If so, how much? Climbing several flights of stairs.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

7. Does your health now limit you in this activity? If so, how much? Climbing one flight of stairs.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

8. Does your health now limit you in this activity? If so, how much? Bending, kneeling, or stooping.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

9. Does your health now limit you in this activity? If so, how much? Walking more than a mile.
   1. Yes, limited a lot
   2. Yes, limited a little
   3. No, not limited at all

10. Does your health now limit you in this activity? If so, how much?
Walking several blocks.
1. Yes, limited a lot
2. Yes, limited a little
3. No, not limited at all

11. Does your health now limit you in this activity? If so, how much?
Walking one block.
1. Yes, limited a lot
2. Yes, limited a little
3. No, not limited at all

12. Does your health now limit you in this activity? If so, how much?
Bathing or dressing yourself.
1. Yes, limited a lot
2. Yes, limited a little
3. No, not limited at all

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your PHYSICAL HEALTH?

13. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Cut down the amount of time you spent on work or other activities.
1. Yes
2. No

14. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Accomplished less than you would like.
1. Yes
2. No

15. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Were limited in the kind of work or other activities.
1. Yes
2. No

16. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Had difficulty performing the work or other activities (for example, it took extra effort).
1. Yes
2. No

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?

17. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Cut down the amount of time you spent on work or other activities.
1. Yes
2. No

18. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Accomplished less than you would like.
1. Yes
2. No

19. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Didn't do work or other activities as carefully as usual.
1. Yes
2. No

20. During the past 4 weeks, to what extent has your physical health OR emotional problems interfered with your ormal social activities with family, friends, neighbors, or groups?
    1. Not at all
    2. Slightly
    3. Moderately
    4. Quite a bit
    5. Extremely

21. How much bodily pain have you had during the past 4 weeks?
    1. None
    2. Very mild
    3. Mild
    4. Moderate
    5. Severe
    6. Very severe

22. During the past 4 weeks how much did pain interfere with your normal work (including both work outside the home and housework)?
    1. Not at all
    2. A little bit
    3. Moderately
    4. Quite a bit
    5. Extremely

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

23. How much of the time during the past 4 weeks: Did you feel full of pep?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

24. How much of the time during the past 4 weeks: Have you been a very nervous person?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

25. How much of the time during the past 4 weeks: Have you felt so down in the dumps that nothing could cheer you up?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

26. How much of the time during the past 4 weeks: Have you felt calm and peaceful?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

27. How much of the time during the past 4 weeks: Did you have a lot of energy?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

28. How much of the time during the past 4 weeks: Have you felt downhearted and blue?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

29. How much of the time during the past 4 weeks: Did you feel worn out?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

30. How much of the time during the past 4 weeks: Have you been a happy person?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

31. How much of the time during the past 4 weeks: Did you feel tired?
    1. All of the time
    2. Most of the time
    3. A good bit of the time
    4. Some of the time
    5. A little of the time
    6. None of the time

32. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?
    1. All of the time
    2. Most of the time
    3. Some of the time
    4. A little of the time
    5. None of the time

33. How true or false is the following statement? I seem to get sick a little easier than other people.
    1. Definitely true
    2. Mostly true
    3. Don't know
    4. Mostly false
    5. Definitely false

34. How true or false is the following statement? I am as healthy as anybody I know.
    1. Definitely true
    2. Mostly true
    3. Don't know
    4. Mostly false
    5. Definitely false

35. How true or false is the following statement? I expect my health to get worse.
    1. Definitely true
    2. Mostly true
    3. Don't know
    4. Mostly false
    5. Definitely false

36. How true or false is the following statement? My health is excellent.
    1. Definitely true
    2. Mostly true
    3. Don't know
    4. Mostly false
    5. Definitely false

Source:
Ware, J. & Donald, C. (1992). The MOS 36 item short-form health survey (SF36). *Medical Care. 30 (6) 473-483.*

Name **Date**

POSTPARTUM BONDING SCALE

Please indicate how often the following are for you. Choose the answer which seems right in your **recent experience**. There are no 'right' or 'wrong 'answers.

Statement	Always	Very Often	Quite Often	Some-times	Rarely	Never
I feel close to my baby						
I wish the old days when I had no baby would come back						
I feel distant from my baby						
I love to cuddle my baby						
I regret having this baby						
The baby does not seem to be mine						
My baby winds me up						
I love my baby to bits						
I feel happy when my baby smiles or laughs						
My baby irritates me						
I enjoy playing with my baby						
My baby cries too much						
I feel trapped as a mother /father						
I feel angry with my baby						
I resent my baby						
My baby is the most beautiful baby in the world						
I wish my baby would somehow go away						
I have done harmful things to my baby						
My baby makes me feel anxious						
I am afraid of my baby						
My baby annoys me						
I feel confident when caring for my baby						
I feel the only solution is for someone else to look after my baby						
I feel like hurting my baby						
My baby is easily comforted						

Source: Brockington, I., Fraser, C.& Wilson, D.(2006) The postnatal bonding questionnaire: a validation. *Archives of Women's Mental Health* p.233-242. DOI:10.1007/s00737-006-0132

Name _____ **Date** _____

Hospital Anxiety and Depression Scale (HADS)

Choose one response from the four given for each statement. Tick the box that best describes how you are currently feeling.

	I feel tense or 'wound up':	
	Most of the time	
	A lot of the time	
	From time to time, occasionally	
	Not at all	

	I still enjoy the things I used to enjoy:	
	Definitely as much	
	Not quite so much	
	Only a little	
	Hardly at all	

	I get a sort of frightened feeling as if something awful is about to happen:	
	Very definitely and quite badly	
	Yes, but not too badly	
	A little, but it doesn't worry me	
	Not at all	

	I can laugh and see the funny side of things:	
	As much as I always could	
	Not quite so much now	
	Definitely not so much now	
	Not at all	

	Worrying thoughts go through my mind:	
	A great deal of the time	
	A lot of the time	
	From time to time, but not too often	
	Only occasionally	

	I feel cheerful:	
	Not at all	
	Not often	
	Sometimes	
	Most of the time	

	I can sit at ease and feel relaxed:	
	Definitely	
	Usually	
	Not Often	
	Not at all	

	I feel as if I am slowed down:	
	Nearly all the time	
	Very often	
	Sometimes	
	Not at all	

	I get a sort of frightened feeling like 'butterflies' in the stomach:	
	Not at all	
	Occasionally	
	Quite Often	
	Very Often	

	I have lost interest in my appearance:	
	Definitely	
	I don't take as much care as I should	
	I may not take quite as much care	
	I take just as much care as ever	

	I feel restless as I have to be on the move:	
	Very much indeed	
	Quite a lot	
	Not very much	
	Not at all	

I look forward with enjoyment to things:	
As much as I ever did	
Rather less than I used to	
Definitely less than I used to	
Hardly at all	

I get sudden feelings of panic:	
Very often indeed	
Quite often	
Not very often	
Not at all	

I can enjoy a good book or radio or TV program:	
Often	
Sometimes	
Not often	
Very seldom	

Source:
Zigmond, A. & Snaith, R. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinaviavica.* 67: 361-370

Name:_____ Date: _____

Pittsburgh Sleep Quality Index (PSQI)

Instructions: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of of days and nights in the past month. **Please answer all questions.**

1. During the past month, what time have you usually gone to bed at night? _____
2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night? _____
3. During the past month, what time have you usually gotten up in the morning? _____
4. During the past month, how many hours of actual sleep did you get at night. (This maybe different to the number of hours you spent in bed.) _____

5. During the past month

, how often have you had trouble sleeping because you…	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
a. Cannot get to sleep within 30 minutes				
b. Wake up in the middle of the night or early morning				
c. Have to get up to use the bathroom				
d. Cannot breathe comfortably				
e. Cough or snore loudly				
f. Feel too cold				
g. Feel too hot				
h. Have bad dreams				
i. Have pain				
j. Other reason(s), please describe:				
6. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
8. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?				
	Very good	Fairly good	Fairly bad	Very bad
9. During the past month, how would you rate your sleep quality overall?				

	No bed partner or room mate	Partner/ room mate in other room	Partner in same room but not same bed	Partner in same bed
10. Do you have a bed partner or room mate?				
	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
If you have a room mate or bed partner, ask him/her how often in the past month you have had:				
a. Loud snoring				
b. Long pauses between breaths while asleep				
c. Legs twitching or jerking while you sleep				
d. Episodes of disorientation or confusion during sleep				
e. Other restlessness while you sleep, please describe:				

Source:
Buysse, D.J., Reynolds, C.F., Monk, T.H., Berman, S.R. & Kupfer, D.J. (1989). The Pittsburgh Sleep Quality Index (PSQI): a new instrument for psychiatric research and practice. *Psychiatry Research* 28:193-213

The Townsville Hospital
James Cook University
Protocol Name : A mixed methods study of the experiences of women and/or their partner following an intensive care unit admission during pregnancy or in the postnatal period.

Semi-structured Interview 1 proforma

6 weeks post birth

Name ……
Residential postcode……. Date of Interview …….

G__P__ …… Type of birth SVB…… C/S …….Instrumental…….

Gestation …… Maternal age …….. Ethnic origin ……..

ICU admission Antenatal Intrapartum Postnatal

Previous ICU Admission Y N

The aim of the questions in the semi structured interview is to prompt the woman to tell her story. Questions such as the following will be asked:

Tell me about your intensive care unit admission.

Describe what it was like for you.

Tell me about the contact you had with your baby during your admission to ICU(if postnatal admission)

Describe what this was like for you.

Tell me how you are feeling now.

Describe how your intensive care admission has influenced your experience of becoming a mother.