AN INVESTIGATION INTO THE USE OF WATER IMMERSION UPON THE OUTCOMES AND EXPERIENCE OF GIVING BIRTH

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ABSTRACT

The use of deep-water immersion during labour and birth is commonplace in many countries including Australia, yet there has been little contemporary Australian data from which to form policies regarding its use during childbirth, or which have included women's experiences using water immersion.

The literature reviewed for this study was positive with regard to the effect of water immersion during childbirth and was associated with decreased rates of perineal trauma, low episiotomy rates, low rates of analgesic use, lower operative deliveries coupled with increased maternal satisfaction of the experience of childbirth when compared with births where water immersion was not involved.

The purpose of this research was to investigate the influence of deep-water immersion upon maternal and neonatal outcomes and women's experiences of giving birth in Australia. This study used a mixed method in an attempt to fulfil this purpose: the first phase was a Quasi-experimental design and the second phase was based upon a Hermeneutic Phenomenological approach. Data were collected via a Random Chart Audit, from a random sample of fifty nulliparous women who used deep-water immersion during labour and childbirth and six women were selected to participate in a semi-structured interview.

Data from each phase of this study revealed positive birth outcomes and these findings were supported by the literature. The women's stories were positive and comprised elements of four lifeworld themes.

- *Water's Embrace*
- *Warped Time*
- *Naked but Clothed*
- *The Shape of Water.*

Each of these themes encapsulated different aspects of the women's experiences, which when considered together, increased the understanding of the phenomenon of deep-water immersion upon the experience of giving birth.

STATEMENT OF SOURCES

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No other person's work has been used without due acknowledgment in the main text of the thesis.

This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution.

All research procedures reported in the thesis received approval of the relevant Ethics/Safety Committees.

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TABLE OF CONTENTS

AN INVESTIGATION INTO THE USE OF WATER IMMERSION UPON THE OUTCOMES AND EXPERIENCE OF GIVING BIRTH

CHAPTER ONE

When I wasn't in the pool the pain was really hard on me, the pain was unbearable...but in the pool I was able to stretch out and relax… I was able to rest…The pain was amazingly less in the water...I wouldn't change a thing...certainly not without a pool...I wouldn't, I wouldn't be able to

('Molly', 2002)

INTRODUCTION

This study began with a curiosity and concern arising from personal experience in independent midwifery practice, in particular the experience of attending women using a deep bath of water during childbirth. Reflecting upon these experiences and talking with other midwives, it appeared that labouring women, immersed in a deep body of water (a birth pool or deep bath) experienced less intervention, a decrease in the length of labour as well as decreased analgesic use. Complementary to this, women described the experience of using water immersion as positive, satisfying and personally empowering. Women also commented on their ability to adopt positions, which allowed them to relax completely between contractions or, use positions, which would have been difficult if labouring on land, for example lying on their 'stomach', squatting or kneeling. They felt more relaxed, and experienced less pain when they were immersed in water. The pool provided a space in which they could labour in privacy. They were able to 'shut' their eyes and immerse themselves in the moment but remain aware enough to 'see' what was happening around them and remain in control. The water was an integral link for women in helping them to achieve a normal, physiological birth. These women told powerful stories that communicated the complexity of both the physical and emotional experience of childbirth. Thus a formal study to capture these experiences was undertaken.

At the heart of this research lies the belief that childbirth is one of life's major events; a unique physical, and emotional moment, the experience of which may have significant long term effects on the mother and her mothering ability (Davis-Floyd, 1992; Kitzinger, 2000a; Reiger, 2001). Modern obstetric practice has been praised for saving the lives of mothers and babies, but has come at a cost in monetary, physical, and emotional terms. High technology solutions are now usurping equally effective alternatives that are more respectful to both mothers and their babies (Wagner, 1994).

Therefore, this study is premised on the following questions. Is the experience of childbirth something for which women are unprepared or does 'nature' somehow 'equip' women for this journey? Why do some women recall birth as a positive

experience and others view it as a negative event, something to be forgotten at all costs?

The childbirth journey encompasses a range of expectations and fears, which may include loss of control, fear of pain, fear of intervention, role change and general uncertainty about the experience. Labour pain is personal, variable and a complex phenomenon (Moore, 1997; Paech, 1996) influenced not only by culture and motivational circumstances, but by the production and secretion of hormones as well (De Punzio, Neri, Metelli, Bianchi, Venticinque et al, 1994, Lowe, 1996, McNabb, 1997). A fundamental assumption of Western culture is that pain is bad and a sign of human weakness (Davis-Floyd, 1992), whereas the pain of childbirth is generally accepted as a normal life process. However, the pain of childbirth is considered by many women as positive pain, expected and accepted as part of childbirth.

This notion is supported by Lundgren and Dahlberg (1998) who, in their phenomenological study, found that the experience of labour pain combined with the strength of childbirth, gave personal meaning to the women's transition to motherhood. This strength and power were found to be responsible for facilitating maternal bonding by providing a way to move the woman closer to and into contact with her baby (Lundgren & Dahlberg, 1998) and this in turn provides us with some understanding of the seemingly contradictory nature of childbirth pain.

The movement back towards 'natural' childbirth, began in the 1970's, manifested itself first in Australia as a time when women began to voice their dissatisfaction with the maternity care that was provided for them. This led them to seek greater control over their birth experience, and resulted in the formation of childbirth education and consumer groups (Reiger, 2001). Women and midwives began to explore other options and included the many non-pharmacological measures to help with childbirth pain. These have included the use of therapies such as Chinese medicine, acupuncture and psychoprophylaxis as well as hypnosis, meditation, formalised breathing patterns and warm showers or baths (Kitzinger, 2000a).

Water immersion to relieve pain and to promote and facilitate normal physiological childbirth is a relatively new concept. However the currently accepted and traditional management of labour with drugs and anaesthesia appears to firstly to have little effect upon the experience of pain, secondly provides no guarantee of effectiveness if given and finally makes women feel drowsy and less able to deal with the contractions. If these pharmacological interventions were administered without informed consent, they left women feeling resentful about the interference of their

experience of childbirth (Davis-Floyd, 1992). The medicalisation of childbirth has affected women, and has resulted in loss of power and control and confiscation of motherhood knowledge (Guilliland & Pairman, 1995).

Whether women choose to use pain relief or not in labour, information and knowledge of all methods available for use should be given during pregnancy and should include the knowledge that childbirth pain is a unique experience for women (Bagness, 2000). This issue is relevant, a major concern and important for virtually all pregnant women (Australian Nursing Council, Royal College of Nursing, & Australian Nursing Federation, 2002; Caton, Corry, Frigoletto, Hopkins, Lieberman, Mayberry, Rooks, Rosenfield, Sakala, Simkin, & Young, 2002; Lowe, 1996). Midwives, as active participants in the provision of maternity care, should ensure women are knowledgeable about all methods of pain relief including those non-pharmacological methods. These methods should be presented to women in a way that is clear unbiased and without coercion (Bagness, 2000). It is unfortunate that little attention appears to have been granted to women's access to evidence based information on available choices (Caton et al., 2002) as congruent with the Code of Practice for Midwives (Nurses Board of Victoria, February 1999).

Midwifery Practice

There is no universal 'women's experience' (Hall & Stevens, 1991). These experiences are subjective, historical and cultural 'truths' which provide a guide for living (Ezzy, 2002) a familiar reality for midwives whose practice is governed by social, cultural and historical mores commonly based on tradition, observation, intuition and personal experience. The Victorian Nurses Board, Code of Practice for Midwives (1999) considers midwifery practice to be women centred, holistic, giving due consideration to the woman's expectations which encompass physical, psychological, social, cultural and spiritual needs. Midwifery practice considers not merely the act of childbirth (the objective view), but how the experience was perceived (the subjective view) by each individual woman. Midwifery practice, which consciously acknowledges feminism as guiding principles, promotes a humanistic, positive effect (McLoughlin, 1997). Although not all midwives practice in a humanistic way, this should be the ultimate goal of midwifery care, that of empowering the women who we provide care 'to' and 'with' (McLoughlin, 1997).

Purpose of Study

The study was divided into two parts, the purpose being to investigate the influence of deep-water immersion upon maternal and neonatal outcomes in part one and in part two the impact of water immersion upon women's experience of giving birth.

The objectives of this study were to:

1: Determine the effect of water immersion upon the following aspects of childbirth:

   A. Length of labour.

   B. Analgesic use.

   C. Maternal morbidity.

   D. Neonatal morbidity.

2: Determine if the length of first stage labour correlated with analgesic use.

3: Explore women's experience of using deep-water immersion during childbirth.

Definition of Terms

The following definitions are used throughout this study.

Nullipara: A woman who has never given birth to a child.

Immersion in water: The use of a deep bath, spa or purpose built tub where the depth of warm water was sufficient for the woman to have her abdomen covered and move freely in any position she chose.

Active birth: A labour and birth where the woman has the complete freedom to adopt any upright position she chooses such as standing, kneeling squatting and is an attitude of mind as well as position of her body (Balaskas, 1984).

Bed birth: Vaginal birth on a bed in any position (Burke & Kilfoyle, 1995).

Air birth: The baby was born out of water.

Waterbirth: The act of giving birth to a baby, where the mother is immersed in water and the baby is born into the water before being brought to the surface to commence respiration.

Limitations of the Study

The major limitations of this study were the sample size of 50 women and the population from which this sample was drawn. However, to reduce bias the women were randomly selected from a total population of 240 nulliparous women who used deep-water immersion during childbirth. Data were collected from first time mothers who chose to labour in water at home under the care of two independent midwives. It is uncommon for women who plan a hospital birth to be allowed to labour and give birth in water thus there was no choice but to select from within this 'labour at home' population.

Significance of the Study

There is little contemporary Australian research regarding deep-water immersion during childbirth and it appears timely that research be conducted into this non-invasive strategy to relieve childbirth pain, and to determine whether or not it facilitates a normal birth with positive maternal and neonatal outcomes.

Independent midwives in Victoria are known to be using water immersion for both labour and birth (Parratt & Sprague, 1999). In addition, there are anecdotal accounts of midwives in hospital also using water for pain relief, who have had to rely on information about the effects of water immersion gleaned from peers, or research published outside Australia (Mercy Hospital for Women, 2000; Monash Medical Centre Family Birth Centre, 2001). Some Australian hospitals who use water immersion during childbirth have drawn up protocols and official policies for water use, but these have not been implemented by hospitals due to lack of support from medical staff (Price, 1995).

It is imperative however, if women are to receive the 'best practice' care, then maternity providers must have access to current evidence on which to base practice, not that embedded in emotion and culture. Enkin et al (2000) describe evidence-based care as the "conscientious, judicious, and explicit use of current best evidence in making decisions about the care of individual patients" (p4). It is a clinical activity enabling midwives to deliver the best quality, effective care for women (Beanland, Schneider, LoBiondo-Wood, & Haber, 1999) and is required by midwives when evaluating and recommending 'best practice', the balance between best for mother, baby and community including costs of providing that service.

This study has not attempted to identify whether or not waterbirth is superior to bed birth or birth on land. Attaching such a quality to water only detracts from the

experience of women who did not use deep-water immersion during childbirth, making waterbirth yet another 'tool' to disempower women and undermine their self-esteem (Price, 1995). Promoting deep-water immersion as superior could be interpreted as self serving, rigid and prescriptive, removing the element of choice from women. This study has however, attempted to identify the outcomes and experience of women who used deep-water immersion during the birthing process.

The significance of this study is the potential to inform protocols as to date Australian hospitals have not taken into account international experience when rules are drafted regarding the use of water immersion during childbirth. These 'rules' effectively deny women opportunities to use non-pharmacological methods of pain management, as well as restrict midwifery practice (Collette-Paule, 1997). Midwifery research provides specialised knowledge on which to base practice. This in turn empowers the profession to anticipate and meet constantly shifting changes in midwifery whilst maintaining our societal relevance (Beanland et al., 1999). Research can then enable midwives to be responsive to changes and trends of mutual benefit to women and midwives, and findings which effect childbirth options, actively disseminated (Burns & Kitzinger, 2000).

The Phenomenon of Pain

A characteristic of labour pain is its individuality. Pain may be defined as having two basic components, a primary phenomenon consisting of afferent output from sensory receptors and a secondary phenomenon involving recognition, interpretation and reaction to the stimuli (Caton et al., 2002; Lowe, 1996).

A number of explanations have attempted to describe how pain is transmitted and perceived, however the 'Gate Control Theory' is the one most often quoted. This theory suggests that under certain circumstances, a painful stimulus feels less painful than under other circumstances. This is not to say that there is no pain, just that the perception of the pain is altered. This is dependent upon the activity of both excitatory and inhibitory nerve fibres as the brain receives other non-painful or pleasant stimuli (Yerby, 2000). The balance between painful and non-painful stimuli reaching the neocortex determines the level of pain experienced (Simkin, Whalley, & Keppler, 2001; Telfer, 1997). Stress and fear in labour cause the 'gate' to open, increasing the level of pain experienced. Many authors have expressed the view that this is a predictor of a negative birth experience (Odent & Johnson, 1994; Simkin et al., 2001; Squire, 2000; Telfer, 1997; Yerby, 2000), with nulliparous women experiencing greater levels of pain than multigravidae (Lowe, 1996).

The important hormones effecting pregnancy and labour include ß-endorphin, progesterone, oxytocin, cortisol, prostaglandin, oestrogen and the catecholamines (adrenaline and nor-adrenaline) (Hung, 1987). All these hormones affect normal female physiology, many interacting with each other (Hung, 1987; Odent, 2001; Parratt, 2000). ß-endorphin levels rise significantly during the third trimester of pregnancy, and are thought to have an opioid, pain relieving quality (De Punzio, Neri, Metelli, Bianchi, Venticinque, Ferdeghini, & Fioretti, 1994; Moore, 1997; Odent, 2001; Parratt, 2000). Although specific effects are yet to be categorically identified, it has been suggested that these endogenous opioids increase maternal pain threshold during late pregnancy and labour and at the time of giving birth (McNabb, 1997; Odent, 2001). ß-endorphins are morphine like substances which work to adjust pain sensation (Yerby, 2000), create a sense of well being (Moore, 1997), and reach a peak during labour and when giving birth (De Punzio et al., 1994). Adrenaline and nor-adrenaline (catecholamines) together with cortisol are 'stress' hormones, which are secreted in response to stress and or pain. Catecholamines are thought to inhibit the action of ß-endorphins by reducing their levels, and may cause an increase in pain. Increased catecholamine levels are associated with prolonged labour and interventions such as augmentation of labour (McNabb, 1997).

It has long been recognised that fear during childbirth increased women's levels of pain (Read, 1970), findings which are supported by Odent (2001), Yerby (2000), Moore (1997) and others. Pederson (1992) and Garland (2000) described the effect of stimulating the neocortex during labour. They found that the body responded by producing adrenaline. This interfered with the production of oxytocin as well as ß-endorphin (Garland, 2000; Pederson, Caldwell, Jirikowski, & Insel, 1992) and inhibited the natural progression of labour. In addition, increased levels of adrenaline produced pain, anxiety and stress affecting cardiac output, heart rate and blood pressure giving rise to maternal hyperventilation which in turn decreased cerebral and uterine blood flow by vaso-constriction (Telfer, 1997). This chain reaction may result in maternal alkalosis and potential fetal hypoxia as well as inhibiting oxytocin production thus interfering with uterine action by decreasing effective contractions (McNabb, 1997; Telfer, 1997). De Punzio, Neri, Metelli, Bianchi, Venticinque, et al (1994) measured maternal, and fetal, ß-endorphin levels in two groups of women. One group (control) did not train in special breathing to reduce childbirth stress and the other did. They proposed that measuring ß-endorphin levels would indicate whether labour had been stressful or not. This suggestion was proposed in response to the results of their study, which demonstrated that women who gave birth vaginally had significantly

higher levels of ß-endorphin than women who had undergone a caesarean delivery (De Punzio et al., 1994). They went on to suggest that high ß-endorphin levels might be an adaptation response to the demands of giving birth (De Punzio et al., 1994). Furthermore, the study by Collette-Paule (1997) suggests that high levels of ß-endorphin found in the fetus may be an adaptation response for life outside the womb with reduced levels of ß-endorphin found in cases of fetal distress.

To the contrary, being 'relaxed' in labour promotes effective release and production of ß-endorphin's and oxytocin enabling effective uterine contractions whilst also decreasing secretion of adrenaline thus facilitating physiological birth (Balaskas, 1989; Balaskas & Gordon, 1991; Morrin, 1997; Odent, 2001). This fine balance of hormones is easily disturbed when a labouring woman is anxious or stressed about what is happening 'to' her as well as 'around' her, labour may slow down or stop altogether (Odent, 2001). Odent (2001) describes this inhibition of childbirth as a 'brake', a highly developed response in humans to potentially dangerous situations. To the contrary, the use of water during labour appeared to enhance relaxation with women becoming calmer and seemingly more relaxed (Odent, 2001) with less complaints of pain requiring analgesic relief (Cluett, 1999; Morrin, 1997).

Brown (1998) suggests that the ideal analgesia for labour must, relieve suffering, not interfere with the progress of labour, and be safe for baby. It appears from the literature that the use of a deep-water immersion during labour fulfils these requirements for women due to the relaxing, stress relieving properties, which promote ß-endorphin release and reduce adrenaline production in labour (Morrin, 1997; Odent, 2001). Some literature suggests that water use may be considered controversial (Collette-Paule, 1997) making it an imperative that research into the use of water during childbirth be conducted to establish sound clinical practice guidelines and protocols, and to share research with peers and clients.

LITERATURE REVIEW

The focus of the literature review directly relates to the purpose and objectives of this study and includes some background literature on the use of water immersion from a historical and philosophical perspective.

An extensive review of the literature published between 1990-2002 was undertaken, however a small number of relevant articles dated prior to 1990 are included. Material for the review was obtained by utilising a number of sources including books, journals and electronic databases. There was little contemporary Australian research in the literature regarding the use of water immersion during labour, and/or birth, although

numerous studies from England and Europe were accessed. However, there was an unpublished thesis by Price (1995) who compared the outcomes of waterbirth and air birth at one Australian birth centre. Material that explored women's experience of using water immersion during childbirth was limited.

The portrayal of water immersion in the literature has as much to do with the point of view of the author as with evidence and research. How water is used during childbirth is as much a social as well as a cultural experience. Because there has been little consistency of methods and methodology between the reported studies, it was difficult to compare like with like. Waterbirth and water immersion can mean different things to different people. It is as varied as using a bath as well as a deep pool or in some cases, giving birth in the sea.

There has been a continuing decline in the number of births for Victorian women since the mid 1960,s when the annual birth rate was approximately 20 per 1,000 mean resident population. This rate has dropped to 13.1 per 1,000 mean resident population for the year 2000 (Perinatal Data Collection Unit, 1999) with a total Australian fertility rate of 1.6 babies per woman (Australian Bureau of Statistics 2002).

As women have fewer children, the way childbirth is experienced is incredibly important, they may not have another opportunity to experience childbirth. Women aspire to enter motherhood in a 'life enhancing' manner, a start to family life that lays the foundation for caring and confident parenthood (Buckley, 2002). Indeed, a positive first birth experience is associated with high levels of maternal self-efficacy in Australian women (Drummond & Rickwood, 1997; Tracy, 2002).

Making childbirth as satisfying as possible for the mother and her family, enabling women to feel in control and being 'allowed' to make decisions about their care were identified by Zander and Chamberlain (1999) as some of the objectives of good labour care. Good labour care is a balance between "scientific objectivity and a concern for the woman's wishes" (Zander & Chamberlain, 1999, p.723) which should involve not only providing clinical care but also appropriate emotional and physical support (Enkin, Keirse, Neilson, Crowther, Duley, Hodnett, & Hofmeyr, 2000).

Enkin et al. (2000) describe effective care as a balance of priorities between what is best for the mother and the baby, as well as taking into consideration the rising costs of providing that care. They state that "All of these goals are important, but often they involve trade-offs" resulting in widely different recommendations and opinions in countries similar to Australia (Enkin et al., 2000, p.3).

It is known that birth physiology is influenced both by the physical and emotional environment (Enkin et al., 2000; Odent, 2001) with emotional stress in labour linked with longer, difficult or more painful childbirth. Labouring women are commonly exposed, experience bright lights and unfamiliar smells, and are asked often-complex questions or undergo continuous fetal monitoring during childbirth thus stimulating the Neocortex or thinking part of the brain. Zander and Chamberlain (1999) recommend that relevant facilities such as water pools should be made available as this may improve the physical environment that women labour and give birth within.

Some authors view water immersion as more beneficial for the labouring woman and not "the birth attendant" (Wagner, 1994, p.6). This view is supported by Johnson (1996, p.202) who suggests that using water immersion during labour limits the use of a whole range of current obstetric interventions" which is perhaps a covert reason for its criticism by those committed to active obstetric intervention. Odent and Johnson (1994) propose this is due to obstetrician's obsession with technology during the 1970's in their mistaken belief that the only way to improve birth statistics was to develop more sophisticated monitoring machines for use during labour. This electronic age of childbirth was implemented without any scientific evaluation of the possible side effects of this intervention (Odent & Johnson, 1994) and became the catalyst for the 'natural childbirth' movement to emerge.

Kitzinger (2000) feels that the confusion surrounding the safety of water use is partly attributable to "obstetricians being more likely to take notice of sensationalist media stories than from reputable peer journals" (p.470). She questions if this is because water immersion during labour is a political issue, perceived as a potential threat to established obstetric 'territory', as waterbirth with a few exceptions, is birth attended primarily by midwives (Kitzinger, 2000b). Johnson (1996) comments that waterbirth was only one ingredient in a "holistic approach to pregnancy, labour and childbirth" (p.202), which includes the promotion of natural birth.

Management of labour pain is both a social and ethical issue. It is simplistic to blame increasing rates of intervention during childbirth solely upon the power of the medical-obstetrical system. Pain during childbirth can have a devastating and de-humanising effect upon women at a time of extreme emotional and physical need (Brownridge, 1995; Moore, 1997) and methods to relieve it are of major concern to women and their families. Simkin (2000) wrote that the pain of labour, is feared by many women, and Bagness (2000) found that childbirth pain is one of women's main concerns when pregnant (Bagness, 2000). "Disease can destroy the body, but pain can destroy the soul," said Greipp (1992, p.44). Pain that is associated with trauma, disease or

surgery can be conquered with the use of modern pharmacology (Moore, 1997; Niven & Murphy-Black, 2000). Whereas labour pain is different, it challenges both women and midwives, as it is a uniquely personal experience "demonstrating an astonishingly high degree of variability among individuals with respect to its intensity, distribution and temporal characteristics" (Paech, 1996, p.23). Indeed we are fortunate to have modern methods available to use when needed to reduce childbirth pain, nevertheless these methods have considerable implications for health care systems with respect to the quality, outcome, and cost of providing intrapartum care (Caton et al., 2002). The 'one-size-fits-all' model in current use cannot cope with the individuality of pain, however we live in a culture that prizes and puts faith in technology, rewarding those who can master it (Buckley, 2002). The masculine and paternalistic obstetric model of intrapartum care has insinuated that childbirth pain is a battle to be conquered by any means possible (Caton et al., 2002; Mander, 1998). However, it may be prudent to note that all pharmacological methods used to assist women cope with the pain of childbirth have the potential to detrimentally affect the mother, her baby, or both. In addition, childbirth pain is not always viewed negatively (Mander, 1998) and a growing number of women view it as 'pain with a purpose' (Kitzinger, 1982, 2000a; Simkin et al., 2001), an appropriate physical response to childbirth, and wish to fully experience labour without resorting to pharmacological methods of pain relief (Moore, 1997). Also, a totally pain free labour in not necessarily associated with a satisfying outcome as women may feel 'cheated' of the experience of giving birth which may lead to feelings of dissatisfaction with their birth experience (Moore, 1997).

Cultural influences affect women's individual reactions to childbirth pain (Caton et al., 2002; Telfer, 1997), but as birth becomes more 'managed', it is now uncommon for women to hear of other women giving birth without the use of drugs or anaesthetics. Women are more likely to hear stories that portray birth as a time that they are expected to be 'brave' with methods of pain relief becoming a major concern (Caton et al., 2002). This dominant view however is not supported by women writers and researchers like Kitzinger (1982) who regard labour and uterine contractions in a more constructive manner; they are "the body's creative activity" (p.239).

Lundgren and Dahlberg (1998) studied the effect of childbirth pain on women's birth experience. They interviewed nine women who gave birth in a Swedish birth centre finding that the experience of pain combined with strength of childbirth gave personal meaning to these women's transition to motherhood. Women expressed strong negative and positive views of the same experience concluding that the pain of labour

and birth gives "strength and power, and moves the woman closer to and into contact with, the baby" allowing women to 'bond' with their baby (p.109).

Other authors emphasise the qualitative difference of women's experience of labour pain finding that pain experienced in the context of coping, is fundamentally different to pain experienced in the context of helplessness (Caton et al., 2002; Lowe, 1996). Caton et al (2002) reported that this experience of either coping (maintaining control) or helplessness influenced whether women viewed childbirth positively or negatively. They identified a need for evidence-based research to show the purported harmfulness of labour pain (Caton et al., 2002). If water immersion can ease the discomfort and pain of labour without blotting out the experience, it is then curious that this method is not commonly used in Australian maternity units to ease childbirth pain.

Australia has one of the highest rates of obstetric interventions in the western world with high rates of instrumental deliveries. These interventions and use of technology, contrary to expectations, did not improve maternal or neonatal outcomes but were associated with increased risks for mothers (Caton et al., 2002; Enkin et al., 2000) and were costly to use (Tracy, 2002). Instrumental deliveries are implicated in increased maternal morbidity and include vaginal and perineal trauma and damage resulting in urinary incontinence and bowel and sexual problems (Roberts, Tracy, & Peat, 2000). Indeed, intervention rates in Australia are considered so high that they could be described as a normal part of birth where women's business has now become 'big business' with considerable monetary costs to both consumer and community (Barclay, Andre, & Glover, 1989).

During 1992, the British House of Commons published a report into Maternity Services in England. Recommendations arising from this report assert, "all hospitals make it their policy to make full provision for women to choose the position which they prefer for labour and birth, with the option of a birthing pool where this is practicable" (House of Commons Health Committee, 1992). Maternity providers were then advised that water immersion should be made available to all labouring women. Some authors believe that water immersion is more a philosophy of non-intervention than a method or way to give birth (Harper, 2000). The fear and confusion around water immersion and waterbirth are as much to do with the conflict of control versus power of control.

There was little documented use of water in the literature until Russian swimming instructor Igor Tjarkovsky and Frenchman Dr. Michel Odent wrote about their experiences in the 1960's. Tjarkovsky believed that giving birth in water made 'super babies' and credited them with the ability to crawl, walk, and talk faster than 'normal'

babies (Sidenbladh, 1983). Tjarkovsky's ideas were controversial, especially his regime of forcing babies to breastfeed underwater. During a visit to Australia in 1990, Tjarkovsky showed a video of pregnant women swimming in the Black Sea with dolphins. This included footage of a physically aggressive exercise program for children, some of who were kept for long periods of time in the water and showed scenes of babies being breastfed under water (Tjarkovsky, Personal communication July 1990,). Tjarkovsky's proposition was that keeping a child in a watery environment would enable them to communicate with dolphins and whales (Lichy & Herzberg, 1993). To the contrary, Odent believed that water use during childbirth was gentle, woman centred and an aid to a natural, non-interventionist birth (Lichy & Herzberg, 1993; Odent, 1984). Odent recounts the story of the first waterbirth, which occurred in Pithiviers in the 1970's after he purchased an inflatable paddling pool. He was therefore presented with a dilemma; women consistently thwarted the staff's attempts to get them out of the water to give birth. Odent described how women could not wait to get into the pool and he says he witnessed, "impulsive, irrational behaviour", concluding that this was more often than not a sign that a series of strong and effective contractions would follow, leading to the birth of the baby (Odent 1994, p.8). This sometimes occurred even before the pool was full (Odent & Johnson, 1994). Odent and his staff discovered that they now had more to offer women in active labour than a 'shot of painkiller' saying that the most common question asked by women then became how long does it take to fill the pool? (Odent, 1995; Odent, 2000).

The nineteen-eighties saw more personal birth stories emerging in print. Books (Miller, 1990), medical journals (Black, 1999) and consumer journals as well as daily newspapers reported on women's often transforming stories of personal experience with water during childbirth. Kitzinger (1988) reported on the birth of her grandchild at home in a birth pool and Lichy and Herzberg (1993) tell of their first waterbirth in 1985. In 1995, Lawrence Beech, Kitzinger, Ingrey and Balaskas, pioneers of the natural childbirth movement, convened the first international waterbirth conference where findings and statistics were presented (Beech, 1996). This conference, attended by 1,500 midwives, doctors and parents from all over the world proclaimed that waterbirth was no more dangerous for mother or baby than birth in air (Beech, 1996).

Consumer interest in waterbirth and requests for maternity providers to have water immersion available for women to use during childbirth has provoked strenuous positive and negative reactions in the literature from a number of childbirth professionals. Some of the literature was threatening to those maternity providers who supported a woman's right to use water during childbirth. Such was an account

of disciplinary procedures taken against two midwives in the UK who allowed a woman who chose a waterbirth to give birth safely at home (Lewison, 1994). Although this punitive action has not been noted in any other literature, this example shows that the politics of water immersion during childbirth are not unlike that of other women led and midwife promoted changes to current birthing practices.

Positive comments included those of Dr. Black (1999), who described her attendance at a waterbirth and how this 'changed' her medical practice so much so that she chose to use water immersion when she gave birth (Black, 1999), and the following accounts by midwives. Collette-Paule (1997) described her initial scepticism when she began to get requests from women wanting waterbirths. She started to read extensively about "delivering in water" and in finding no contradictory research, began to attend births in water. She wrote that the waterbirths "were wonderful" and states she then became " a true proponent of labouring and delivering in water ever since" (Collette-Paule, 1997, p.5). Cohen (2000) speaks glowingly of the "magic sound" of relief when women entered the pool during childbirth and described the peaceful look on a baby's face which she quoted "tells me the passage has been safe and gentle" (p.3). Cover, (1997) told reporters from U.S. News & World report that "You hear this big sigh, (as women enter the water) and they're just zoned out" (Shute, 1997). These reports are supported by Davis (1997) who wrote that the benefits of water immersion included increased relaxation for mother, a gentle transition for baby and may help ease a difficult birth (Davis, 1997).

This argument that water immersion and waterbirth provided a gentle birth for the babies as well as pain and stress relief for the mother was a common positive thread throughout the literature. However, there were some authors who questioned the safety of mother and baby if women were allowed to labour and give birth in the water.

Negative comments about birth pools were often to do with concerns about the potential for infection or risk of the baby drowning (Austin, Bridges, & Markiewicz, 1997; Brown, 1982; Cammu, Clasen, Van Wettere, & Derde, 1994; Waldenström & Nilsson, 1992). This fear mongering has been argued strongly by many to dissuade women from labouring in water (Johnson, 1996). Faivelson (1998) reporting for the American Medical Tribune News Service reassured women that using whirlpool baths for pain relief was safe. She stated that they can "do so without worrying about increasing their risk of infection, according to Californian researchers"; being immersed in a whirlpool bath during labour was "a good adjunct for pain relief. The swirling water is very relaxing" (Faivelson, March 27, 4:13 2002, p.1).

However, obvious disgust was displayed by Ehrlich who wrote to MidwiferyToday.com (2000) complaining about the 'mess' and 'faeces' present in the water during a planned waterbirth, which prompted her to stand the woman up and wash her body with disinfectant from the breast down before the baby was born. She said, "I had a crowning baby and a pool of water filled with flecks of faeces. I got mom out of the water and cleaned her with disinfectant from her chin to her knees before welcoming baby out. It wasn't fun for any of us" (Ehrlich, March 27, 4:13 2002).

A traditional rationale for discouraging woman to use water during labour has been the belief that contaminated water would enter the vagina leading to infection in either mother or baby, or pose a potential risk to caregivers (Johnson, 1996; Mander, 1998). However, the presence of faeces is viewed positively by midwives as a sign of fetal descent, a common part of childbirth. It is perfectly normal to expel faeces while in second stage write Lichy and Herzberg (1993) who further suggest that in a tub, faeces can be scooped up and emptied into a bucket along with any other debris such as mucus and blood clots (p. 147). Balaskas and Gordon (1991) concur that faeces is easily collected in a mesh 'pooper scooper' as they float to the surface. Garland (2000) advises that the use of a sieve, in addition to keeping the water clear assists in the estimation of maternal blood loss by collecting any blood clots for measurement. Burns and Kitzinger (2000) advise that only in the event of heavy faecal contamination should the woman be temporarily removed from the bath.

It could be suggested to the contrary that small amounts of diluted E-coli in the water may in fact be useful in helping to rapidly colonise the gut of a newborn and activate Vitamin K (Sweet, 1997). At the Ostend maternity centre, 2,500 waterbirths have occurred with no associated maternal or fetal mortality or morbidity (Ponette, 1999). They conducted a retrospective comparison of 1,000 waterbirths compared with 1,000 air births, the aim being to exclude increased risk to mother and baby during a birth in water. Women were matched for age, education, previous caesarean section, parity, and gestation. Both the control and the waterbirth group were homogeneous with respect to maternal characteristics. This study concluded that there was no difference between the two groups for Apgar score, neonatal infection or transfer to a neonatal unit (Eldering & Selke, 1999).

Price (1995) studied the outcomes of women who had a waterbirth and compared them with women who birthed in air. This retrospective comparative study compared the outcomes of 196 low risk women who gave birth at The Royal Hospital for Women, Birth Centre over a two-year period, January 1 1993 - December 31 1994. The waterbirth group (n=98) included both nulliparous and multiparous women whose

outcomes were compared to a control group of women who birthed in air (n=98). The variables studied were genital tract trauma, postpartum blood loss and the presence of any maternal or neonatal morbidity. The findings from this unpublished thesis did not demonstrate statistically significant differences between the water and air birth groups. However, this study identified that the waterbirth group had a higher proportion of intact perineum's although this was not statistically significant possibly due to the small sample size. Price (1995) concluded that giving birth in water does not affect short-term maternal or neonatal morbidity or mortality and recommended that water immersion is a viable and legitimate choice for low risk women giving birth.

A retrospective chart audit by Waldenström and Nilsson (1992) to investigate any potential risk with water immersion compared 89 women who laboured and/or gave birth in water with a control group of 89 women who did not use water. Their study, like Nikodem (2000) and Otigbah, Dhanjal, Harmsworth, and Chard (2000), found no statistical difference between the two groups. They also failed to show any link between immersion in water and infection in either mother or baby, although they did identify a potential for lower 5 minute Apgar scores amongst babies born to women whose membranes had been ruptured for more than 24hours before giving birth (Waldenström & Nilsson, 1992). Nevertheless, this finding has not been supported in the literature, and water immersion and maternal or infant infection was not linked in any studies cited (Alderice & Marchant, 1997; Beech, 1996; Brown, 1998; Cammu et al., 1994; Chalmers & Porter, 2001; Collette-Paule, 1997; Eckert, Turnbull, & MacLennan, 2001; Geissbuhler & Eberhard, 2000; Gilbert & Tookey, 1999; Glazener, Abdalla, Stroud, Naji, Templeton, & Russell, 1995; Kildea, 1996; Nikodem, 2000; Odent, 1995; Otigbah, Dhanjal, Harmsworth, & Chard, 2000; Ponette, 1999; Rush, Burlock, Lambert, Loosley-Millman, Hutchison, & Enkin, 1996).

Kildea (1996) conducted a written survey of 54 midwife participants and found to the contrary, some midwives believed that water decreased the potential for infection as water dilutes blood born particles. This study is supported by that of Alderice, Renfrew, Marchant, Ashurst, Hughes, Berridge, and Garcia (1995), who conducted a retrospective survey of 8,255 women who used water immersion for labour but left the pool to give birth, and 4,494 women who laboured and birthed in water. They concluded that infection due to water immersion in labour was not found in either mother or baby and that there was no evidence to suggest that water immersion for labour or birth was detrimental to either mother or baby's well being.

Lichy and Herzberg (1993) suggest that being immersed in water encourages women to adopt and maintain 'active birth' positions during their labour, positions that promote

optimal pelvic diameters and contribute to normal physiological labour and birth. Steer and Flint (1999) suggest it is helpful to provide an environment in which women can vary their position at will, such as a birth pool. They claim that restricting women's movement during labour and position for birth is not effective, efficient or necessary and, increased the pain of labour. In addition, they demonstrated low levels of maternal satisfaction with the experience of childbirth when movement was restricted (Steer & Flint, 1999). This finding is supported by Morrin (1997) who when discussing midwifery care in the first stage of labour, suggests that the relaxing effects of water immersion contribute to maternal satisfaction with labour and birth.

The safety of labouring and giving birth in water was questioned in some of the literature. The concerns expressed were personal opinions regarding safety (Plaat, 1998), fear of risk of infection (Walker, 1994), or referred to incidents which occurred when there was no appropriate care of the mother during labour (Robinson, 1993). One study reported the death of a baby who was deliberately kept underwater by the parents for 30 minutes after the birth and who subsequently died (Robinson, 1993). There was one reported case of severe neonatal polycythaemia attributed to delayed clamping of the cord after the birth of the placenta underwater (Austin et al., 1997), although this has not been shown in any other literature cited. This case is dismissed by (Odent, 2000) as yet another familiar 'anecdote' about water immersion repeated in the media but without any basis for concern.

Although the potential risk of infection for either mother or baby has been hypothesised as a 'problem' with water immersion, to the contrary, Gilbert and Tookey (1999) published the perinatal mortality and morbidity rates of 4,032 babies born into water in Britain. They compared two groups of women who were considered 'low risk' and found that babies born in water had fewer admissions to special care nurseries than for similar 'low risk' births that did not take place in water. Furthermore, between April 1994 to April 1996, all 1,500 consultant paediatricians in Britain were surveyed monthly by the British Paediatric Surveillance unit. Each paediatrician was asked to report any births that met the definition of perinatal death or admission to special care within 48 hours of birth following a labour or birth in water. These findings were compared with mandatory notifications to the British Paediatric Surveillance unit as well as a postal survey to all National Health maternity hospitals (units) to determine the total number of births during the study period. There were 5 perinatal deaths among 4,032 waterbirths the reported rate being 1.2 per 1,000. Furthermore, none of these perinatal deaths was attributed to use of water immersion during labour or birth. The causes of neonatal death were one stillbirth diagnosed before immersion, another

occurred at home following a concealed pregnancy where the mother received no antenatal care, one was a case of neonatal herpes infection aged three days, there was one case of intracranial haemorrhage after a precipitous birth and one baby was found to have hypoplastic lungs on post-mortem (Gilbert & Tookey, 1999).

Brown (1998) conducted a retrospective chart audit at Good Hope National Health Scheme Trust between 1994-1996. Over this period, 541 women used water immersion during labour and 343 went on to give birth in the water, including 10 women who had previously had a caesarean section. The waterbirths were compared to the air births, the data suggesting that not only was labour and birth in water no more dangerous for low risk women than air birth, but women found it a positive experience; they felt that the water helped them remain in control of their labour.

Professionals were often reported to offer advice about this 'fad', however a consistent theme from all the literature read was the need to perform more research into this subject (Alderice & Marchant, 1997).

Some authors used the neonatal Apgar score as a predictor of poor outcomes. Burke and Kilfoyle (1995) found that the mean Apgar score of both waterbirth and air birth babies to be the same. Garland and Jones (1994) found no difference in the Apgar scores of babies born to women who used water. Rosevear, Fox, Marlow and Stirrat (1993) reported that the 'fashion' of using birthing pools had resulted in two cases of unexplained perinatal asphyxia in babies whose mothers had used a birth pool. Although they did not claim a causal relationship between the pool and the perinatal asphyxia, this focus of the 'potential' for problems to occur is not based on available or reliable research and these types of opinion do not serve to inform the reader. Beech (2000) claims that some obstetricians employed a variety of tactics to discourage women from using water claiming that labour and birth in water was dangerous and risky, and the opinions expressed ranged from hysteria to sarcasm, none of it based on scientific evidence.

Labouring in water was viewed overall in the literature as acceptable but waterbirth as potentially dangerous especially the perceived risk of a baby drowning. Johnson (1996) writing in the British Journal of Obstetrics and Gynaecology discusses the physiology of fetal and neonatal breathing and why babies do not breathe underwater. He found that before birth, the 'at term' baby in utero breathes intermittently approximately 40% of the time and is not merely a practice for extra uterine life. He reported that the larynx acts as a valve during fetal breathing movements aided by inspiratory muscles, preventing little intake of amniotic fluid, any of which is then

swallowed, the fetal dive reflex (Johnson, 1996). Forty-eight hours or so before the onset of labour, fetal breathing stops probably due in part to a secondary rise in levels of prostaglandin E2. This rise may be due to release of prostaglandin E2 by the placenta and membranes into the fetal circulation and is thought to prevent a baby breathing underwater (Johnson, 1996). In addition, the stimulus to breathe is thought to occur when receptors on the baby's facial skin, contained within the trigeminal area, are triggered by the passage of air on its face (Eldering & Selke, 1999).

Some concern was shown in the literature of the possibility of increasing the neonate's temperature during labour if the mother became overheated. In a letter to the British Medical Journal in October 1993, Rosevear, Fox, et al expressed concern of the possible consequences of overheating a susceptible fetus by increasing the maternal temperature. Their premise being that this may prevent the fetus from adequately exchanging heat. In a compromised fetus, they claimed this had the potential to cause cerebral vasodilation and an increase in basal metabolic rate and oxygen requirements, which may result in asphyxia (Rosevear, Fox, Marlow, & Stirrat, 1993).

Cefalo and Hellegers (1978) studied the effect of increased maternal temperature on acutely pregnant ewes. It appeared that an increase in maternal temperature increased fetal heart rate and umbilical blood flow allowing exchange of oxygen, nutrients and other gases, and removal of carbon dioxide and heat (Cefalo & Hellegers, 1978). They discovered that when the temperature of the ewe was increased, the fetus became hyperthermic and utero placental perfusion increased. This was only problematic if the fetus was unable to get rid of excess heat via the placental circulation. Hyperthermia of the ewes greater than 2º to 2.5º above resting temperature was linked to decreased maternal and fetal cardiac output and fetal compromise (Cefalo & Hellegers, 1978). Theoretically, if the temperature of the bath water was too hot, it may interfere with the feto-maternal haemodynamic changes in humans to occur. Fetal thermoregulatory control is limited and umbilical circulation is not only a carrier of oxygen and nutrients, but is important for fetal heat exchange (Cefalo & Hellegers, 1978). A fetal death, which occurred in England, was attributed to maternal hyperthermia caused by immersion over several hours of labour in water that was too hot.

The theoretical risk of maternal or neonatal mortality or morbidity due to increased temperature was not supported by the available literature (Otigbah et al., 2000). In general, it was hard to find any reliable scientific evidence to suggest that negative outcomes to mothers or babies occurred when water was used during childbirth.

The History of Water Use

Hydrotherapy has been used over the centuries to heal, relieve pain and has been recognised as medically therapeutic by many cultures, for example Roman and Turkish baths, Native American's and Maori's use of hot springs for pain and stress relief (Enkin et al., 2000; Gordon, 1990). Early human settlements were sited on rivers and by the ocean and ancient rituals and traditions have developed surrounding water (Garland & Jones, 1994) which was commonly used both domestically and therapeutically to relieve stress (Mander, 1998; Nikodem, 2000; Rush et al., 1996).

In some Pacific countries, women laboured by the sea or, as with one Maori tribe in New Zealand, by the river (Burns & Kitzinger, 2000; Odent, 1984, 1995, 2001; Odent & Johnson, 1994). Indigenous Western Australians are said to have walked through the shallows before giving birth on the sand (Odent, 2001), and in some parts of Turkey and North Africa there are accounts of bathhouses used by women at times of menstruation also being used for childbirth (Burns & Kitzinger, 2000). Historically Japanese women would heat water to bathe in during labour to relieve tension (Fusako, 1990). Water immersion during labour was only possible when women had ready access to an ample supply. Warm baths during labour became common last century in particular by British midwives attending middle-class women at home where this plentiful source of hot running water was used for pain relief and comfort (Burns & Kitzinger, 2000), or to keep the father occupied (Odent, 2001).

Ancient Greek Gods used water in their rituals and the ancient Egyptians believed that their priests were born from water. This spirituality is evident today with Christian 'Baptism' symbolised by wetting the head with water (Odent, 2001; Odent & Johnson, 1994). Water used to ease stress or as part of spiritual rituals is commonplace in many cultures (Burns & Kitzinger, 2000) and has come to symbolise alternative, woman-centred childbirth (Redwood, 1999).

The recognised 'pioneer' of using deep-water immersion during childbirth to help women cope with childbirth pain without using drugs was French obstetrician, Michel Odent. His radical work in the maternity unit at Pithiviers in France included using a deep bath of water for labour (Leboyer, 1975; Lichy & Herzberg, 1993). During the 1980's, the BBC made a documentary film about Odent's work at Pithiviers and included footage of a waterbirth. This film generated interest around the world (Lichy & Herzberg, 1993) with many women requesting to use a bath during childbirth for pain relief (Collette-Paule, 1997). Use of water is perceived by some consumers and midwives as a very effective method of pain relief which in addition prevents perineal

trauma, lowers hypertension, increases cervical dilatation, reduces stress, promotes breast milk production as well as provides a smooth and trauma free transition for the baby (Balaskas & Gordon, 1991; Morrin, 1997).

Garland and Jones (1994) suggest the option of using water immersion should be made available for labouring women to control childbirth pain. They performed two retrospective studies on data collected from the birth records at Maidstone Hospital, Kent, during 1992-93 where more than 450 women have used a pool during labour with more than fifty percent remaining in the pool to give birth. Their studies analysed length of labour, use of drugs during labour, incidence of perineal trauma, postpartum haemorrhage (PPH) and the incidence of low Apgar scores, comparing women who used water and those who did not. They noted that in addition to low intervention rates, women who proceeded to birth in water totally avoided the use of pharmacological pain relief (Garland & Jones, 1994). Attwood and Lewis (1994) further support this study. They reported the outcomes of 52 waterbirths they had attended, finding that all women who birthed in water avoided intervention, episiotomies and drugs.

The impetus to use water for pain relief has primarily come from consumers (Enkin et al., 2000) for a variety reasons (Price, 1995) and include waters ability to provide relaxation, freedom of movement, and increased control of the birth environment, whilst also allowing women to remain active and drug free. The feeling of weightlessness provided by being buoyant enables women to easily adopt upright positions, move freely as desired and to relax between contractions.

However, a possible consequence of labouring in water is that woman will not want to get out of the pool and will remain and give birth in the water. Odent (1995) suggests that this may be due in part to the pain relieving effect of water, or because the mother does not want to be touched or moved at the time of birth. The literature suggests that water immersion is beneficial and does not pose a risk to mother or baby but may challenge traditional conventional maternity care with some midwives and doctors wary of suggesting its use. Current obstetric practices during labour such as electronic fetal monitoring, intravenous infusions and epidural anaesthetics, ensure that labouring women are restricted to labouring and giving birth on a bed. These obstetric practices make movement off the bed unsafe or difficult. This restriction of movement increases the pain of labour (Enkin et al., 2000).

A common belief and one reason given by women, is that deep-water immersion would make labour shorter. This is not necessarily the case and there are conflicting

views. In a two-group control study by Burke and Kilfoyle (1995) that compared fifty waterbirths and fifty bed births, they found that women who birthed in water had a slightly longer labour. One reason for this result may be the fact that women who birthed on the bed had a higher incidence of artificial rupture of membranes (A.R.M.) 31% compared with 23% in the waterbirth group. An A.R.M. is likely to shorten labour (Enkin et al., 2000) and may account for the slightly longer labour in the waterbirth group.

The finding by Burke and Kilfoyle (1995) is contradicted by Garland and Jones (1994) who performed two retrospective studies comparing water immersion and non-water immersion. They note that women in the water immersion group had a considerably shorter labour and this result was present in both nulliparous and multiparous women (Garland & Jones, 1994). Their findings support those of Odent (1995) and Otigbah, Dhanjal, Harmsworth, and Chard, (2000) who proposed that immersion in water in would shorten labour and expedite delivery. Attwood and Lewis (1994) reported the birth outcomes of their independent midwifery practice in North London. Their observational study indicated that women who used water immersion had shorter and easier labour and birth (Attwood & Lewis, 1994).

Being upright and active during labour is common in many cultures and is credited with less episodes of severe pain as well as shortening the second stage of labour due in part to the effects of gravity (Enkin et al., 2000). An upright position helps make birth easier for the woman and her baby by increasing the pelvic outlet (Morrin, 1997; Righard, 2001). The support provided by deep-water immersion, allowed women to choose upright positions with ease. It is easier to squat in water than on land and is a reason why this is helpful for women who are older or who have had surgery or disease to their knees and joints and allowed 'large' women to move with ease and not feel self-conscious of their size. In addition, the ability to move freely and adopt comfortable positions during labour is of enormous significance to women's emotional satisfaction with birth (Johnson, 1996). Active birth facilitates normal labour (Balaskas, 1989).

With regard to perineal damage, Garland and Jones (1994) compared two groups of labouring women, those who used water and those who did not. They state that episiotomies are rarely performed when women gave birth in water, and in addition found that fewer women in the waterbirth group suffered perineal trauma. Women who did not use water had an intact perineal rate of 22.3% and an episiotomy rate of 43.8% compared with an intact perineal rate of 39.4% in the waterbirth group with a 0% episiotomy rate. Their study supports the findings of other authors who also found

that women who used deep-water immersion during labour suffered a decrease in perineal trauma (Garland, 2000; Garland & Jones, 1994; Geissbuhler & Eberhard, 2000) particularly in nulliparous women (Murphy & Feinland, 1998). De Punzio, Neri, Metelli, Bianchi, Venticinque et al, (1994), studied the relationship between ß-endorphin levels and maternal relaxation. They found that stress during childbirth not only reduced the pain threshold but inhibited perineal muscle relaxation.

There is a strong causal link between instrumental deliveries and increased rates of perineal trauma. These included tears, first, second and third degree, and episiotomies (Enkin et al., 2000). When an epidural anaesthetic was administered for pain relief, this significantly affected the course of labour, prolonging second stage and increasing the incidence of forceps and ventous deliveries (Weller, 2002), thereby resulting in significantly more perineal trauma (Enkin et al., 2000). Instrumental deliveries are also associated with urinary incontinence. Chiarelli and Cockburn (2002) using a randomised controlled design studied 328 women. They found that 38.4% of women post instrumental delivery suffered urinary incontinence, which they stated had a profound effect on their quality of life. These women also suffered low self-confidence, depression, and increased financial cost (Chiarelli & Cockburn, 2002). Reducing women's need for intervention will therefore reduce rates of instrumental deliveries and improve perineal outcomes.

To promote feelings of maternal wellbeing and reduce stress, many authors have recommended immersion in warm water (Alderice & Marchant, 1997; Balaskas & Gordon, 1991; Bertram, 2000; Brown, 1982; Ehrlich, 2002; Garland, 2000; Morrin, 1997). Women's positive experience of being able to relax between contractions was one of the most common descriptions given in the literature and the most compelling reason given by women to use water immersion during childbirth.

Childbirth without drugs was found to be personally empowering, and emotionally satisfying for women who chose a 'natural' birth (Odent, 2001). The mother is able to focus on her alert newborn, grasp her babe to her chest allowing un-interrupted skin-to-skin contact thereby promoting both the surge of hormones responsible for physiological third stage and initiation of breast milk production (Odent, 2001). In addition, the baby born to a mother who has not used drugs during labour is more alert at birth and will breast feed quicker. All pharmacological analgesics interfere with the baby's sucking urge as they cross from the maternal circulation via the placenta (Nissen, Lilja, Matthiesen, Ransjö-Arvidson, Uvnäs-Moberg, & Widström, 1996), and is one complicating factor involved in failure to breastfeed.

Skin-to-skin contact at birth is also associated with more "affectionate behaviour of mothers towards their infants" (World Health Organization, 2002, chapter 6) and these women have fewer problems with breastfeeding because of this early, positive experience.

This quality of experience can be lost within the Western medical model of childbirth, which encourages often unconsciously, the use of interventions, which affect a woman's sense of self (Reiger, 2001). Decreasing intervention during childbirth may have a flow on effect and for example can increase rates of breastfeeding. Nissen et al (1996) found that pethidine given to women in labour caused respiratory depression in the newborn, delayed sucking and reduced the babies' ability to orientate towards visual and auditory stimuli (Nissen et al., 1996). Failure to breast-feed affects both babies and the community as exclusive breast-feeding up to six months of age has been shown to confer health benefits to babies, mothers as well as the community and is promoted as 'best practice' by The World Health Organization (W.H.O.) (World Health Organization, 2002). Breast fed babies experience a reduced risk of respiratory infections and illnesses to at least one year of age, and for asthma up to six years of age (Van Santen, 2001). W.H.O. guidelines for postnatal care (2000) recommend that for successful initiation of breastfeeding to occur, the mother should have 'skin-to-skin contact' with her baby for at least the first hour after birth. It is proposed that the cost savings to both maternal and child health and in environmental costs are important factors to consider when encouraging and supporting women to breastfeed their babies (Amir, 1998; Nissen et al., 1996; Ten Steps to Successful Breastfeeding, 1989). If babies successfully breast-feed following birth, it is more likely that breast-feeding will be experienced by mothers as achievable and thus helps prolong the length and duration of breast-feeding (Van Santen, 2001; Woodman, 2002).

Childbirth can be personally fulfilling (Kitzinger, 1989) and lead to enhanced self-esteem (Parratt, 2000) or can have a profound detrimental effect if a woman has been subjected to the cascade of intervention associated with 'modern' intrapartum medical care. Goer found that satisfaction with the experience of childbirth is related to, "taking an active role in the process and using little or no pain medication" (Goer, 1995 p. 350). Childbirth has been described as a rite of passage (Davis-Floyd, 1992; Fusako, 1990; Reiger, 2001), a transformative event that changes a woman into a mother (Baldwin & Richardson, 1986; Lundgren & Dahlberg, 1998), a major turning point in women's lives (Belenky, Clinchy, Goldberger, & Tarule, 1986), and is one of the most significant events in a woman's life (Moore, 1997). Parratt (2000) describes

the experience of childbirth as a moment in a woman's life that she will never forget; the impact felt not only during birth but in her life as well. Postpartum depression has been linked with the number of invasive medical interventions performed during labour and women's sense of personal control into their care (Goer, 1995). Baldwin and Richardson (1986) suggest that the way in which women give birth influence not only how they feel about themselves but also how women relate to their partner and children. Medical intervention during childbirth has been shown to reduce women's level of satisfaction with the experience and affects maternal confidence and self esteem (Yerby, 2000), as well as increases the rate of suffering postnatal morbidity (Glazener et al., 1995; Johanson & Newburn, 2001). In a phenomenological study, Gibbins and Thomson (2001) interviewed eight nulliparous women to explore women's experience of childbirth. They concluded that the experience of maintaining personal 'control' during labour was most important to women if they were to experience childbirth as satisfying, fulfilling and positive. Feeling 'in control' depends on the ability to make informed choices during labour (Enkin et al., 2000; Hall & Holloway, 1998) in addition to the information received during pregnancy that promotes women's confidence in their ability to cope with childbirth. These were found to be predictive of a positive childbirth experience (Gibbins & Thomson, 2001). Women need access to information regarding all choices available for managing childbirth pain as the experience of pain impacts upon the experience of childbirth (Shute, 1997).

Cammu, Clasen, Van Wettere and Derde (1994) conducted a prospective randomised trial of 110 low risk nulliparous women with the objective of studying the effect of water immersion during childbirth. Their study aimed to determine firstly whether a warm 'tub bath' during labour relieved pain and secondly assessed how women experienced deep-water immersion. They concluded that though water immersion during labour provided no objective pain relief there was however a temporal pain stabilising effect due to the improved ability to relax in between contractions in addition to overall maternal satisfaction with the experience (Cammu et al., 1994).

In looking at the possible beneficial or harmful effects of immersion in water during labour, it is difficult to ignore the impact which other factors such as midwifery care might have on the outcomes for women choosing waterbirth (Alderice & Marchant, 1997). A weakness in the literature was a deficit of research knowledge that compared the type of maternity care as well as the potential effect of water immersion on childbirth. Alderice and Marchant (1997, p.114) suggest further studies be conducted to, "tease out the implications of these differences". Consequently, the effect of water immersion will be evidence based, reliable and therefore more likely to

be adopted by maternity carers and offered to women as another option available to relieve childbirth pain (Alderice & Marchant, 1997).

Controversy has surrounded the use and benefits of immersion in water during labour and birth although many Australian hospitals have re-modeled their labour wards to include showers and baths due to consumer (Eckert et al., 2001; Price, 1995) and midwife demand (Mander, 1998). Some hospitals have developed protocols and regulations governing the use of deep-water immersion without using evidence based research to support these policies (Kitzinger, 2000b) or do not have any established protocols (Eckert et al., 2001; Price, 1995; Rush et al., 1996). Data on the number of women using water immersion for labour and birth have not been collected as Kildea (1996) suggests possibly due to lack of protocols, support from the establishment and not enough time or energy.

Alternative methods of easing childbirth pain can easily be forgotten in a medical environment (Attwood & Lewis, 1994) and midwives are now meeting informed consumers who require of them up to date knowledge of all options available (Moore, 1997). Women who plan for active birth and a drug free labour are often caught-up in a 'cascade of intervention' leaving them psychologically and or physiologically stressed postnatally, which Yerby (2000) says is "a description of many (or most) women after labour" (p.132).

Many midwives and doctors do not know how to manage normal labour pain or may believe that reduced pain indicates failure to progress (Chalmers & Porter, 2001) or may suffer stress themselves when a woman experiences labour pain (Cronk & Flint, 1989). Research conducted by Greipp (1992) identified a link between inappropriate analgesic use and poor assessment skills by midwives in combination with a lack of knowledge and understanding of options of pain relief available. Moore (1997) considers it important for midwives to identify any deviation from normal during labour, however she cautions us to ensure that " pain is not a symptom used to diagnose illness" (p3).

In Australia, midwifery has emerged from a nursing background. A tenet of nursing is to 'alleviate suffering' thereby encouraging midwives to act as nurses (problem solvers), and assume that all patients who experience pain need pain relief (Greipp, 1992). Sometimes midwives are just following doctor's orders without being in a position to dispute the existing nursing-medicine power relationship (Cronk & Flint, 1989; Doering, 1992; Harper, 2000). However, there are many practitioners who would challenge the automatic use and safety of pharmacological analgesia and

anaesthesia used during childbirth (Enkin et al., 2000; Goer, 1995; Hoope-Bender, 1997; Johanson & Newburn, 2001; Mercy Hospital for Woman Southern Health Service and Women's & Children's Health Service, October 2001; Moore, 1997).

There remains in most labour wards a cultural bias to use therapies such as narcotic analgesics and epidural anaesthetics which all have potentially dangerous side effects for both mother and baby (Chalmers & Porter, 2001; Cluett, 1999; Goer, 1995; Greipp, 1992; Napierala, 1994), and to increasingly consider labour as abnormal (Chalmers & Porter, 2001; Hoope-Bender, 1997). Professional experience using water during childbirth can have a dramatic influence on midwifery culture whilst increasing knowledge of alternative methods available to offer women.

Modern obstetric therapies also impact on the cost of providing services because they are expensive and consume scarce resources (Chalmers & Porter, 2001; Thorp & Breedlove, 1996; Wild, 1993). Epidural anaesthesia influences the course of labour with randomised controlled trials showing epidurals increased the incidence of caesarean section (Halpern, Leighton, Ohlsson, Barrett, & Rice, 1998; Weller, 2002). Caton et al (2002) commissioned a series of evidence-based systemic reviewed articles on the nature and management of labour pain. They summarised the unintended effects of epidurals. These included increasing the likelihood of longer second stage of labour, instrument deliveries, maternal and neonatal fever, Oxytocin augmentation, decreased spontaneous birth, increased third degree and fourth-degree perineal tears. There was also a persistent association with hyperbilirubinemia and maternal hypotension. Epidural anaesthesia was thought to be associated with fetal malpresentation, unexplained neonatal seizure in infants whose mothers had epidural-related fever and increased incidence of bag and mask resuscitation (Caton et al., 2002). Halpern et al (1998) found that because of the increased rate of caesarean section following epidural anaesthesia, some health funds are refusing to pay for epidural labour in an attempt to minimise costs.

There is no evidence to suggest a physiological process should be interfered with or actively managed. The literature suggests a strong causal link between modern obstetric practice, for example artificial rupture of the membranes (ARM), and the ensuing cascade of intervention. This technology would be better directed to genuinely abnormal labour (Chalmers & Porter, 2001; Hoope-Bender, 1997; Righard, 2001) and should be used in a manner that is tailored to each woman and each birth (Johanson & Newburn, 2001).

With a limited health budget, midwives can play a critical role assisting clients and peers to question the real and escalating cost of using these technologies, as well as endorsing and promoting non-pharmacological methods of pain relief (Beanland et al., 1999; Tracy, 2002; Wild, 1993). Many clients have limited knowledge regarding the use of non-pharmacological therapies in labour, creating a power imbalance between clients (who have limited knowledge) and their care providers (seen as having expertise in pain management methods) due to differing knowledge levels and social status (Wild, 1993). Wild (1993) states "society entrusts providers with the responsibility for screening the appropriateness and legitimacy of clients' request for prescription pain medications" (p.55). Hoope-Bender (1997) recommends that routine administration of analgesia should not be applied to all births "regardless of the situation" (p.7) and Wild (1993) asserts that it is imperative that midwives ensure their interests do not supersede those of their clients.

Summary

The use of water for pain relief during labour is not new. The first reported waterbirth was conducted in Germany in 1805 (Cammu et al., 1994) and Dick Read a pioneer in un-medicated birth, advocated a warm bath for painful labour in the 1960's and 1970's (Read, 1970). Evidence around the world is showing that literally tens of thousands of births are occurring with no adverse outcomes for either mother or infant (Geissbuhler & Eberhard, 2000; Nikodem, 2000; Otigbah et al., 2000; Ponette, 1999).

Righard (2001) asks us to consider the effect that modern birth interventions have upon the newborn, suggesting that water is helpful for both mother and baby. For the mother as a method of relieving pain, and for the baby a helpful transition from womb to the outside world (Righard, 2001), an argument supported by Leboyer (1995) who recommended a warm bath for the baby after birth to ease stress. Odent (2001) believes that until recently, a woman could not give birth without producing a potent cocktail of 'love hormones', these hormones necessary for the initiation of mothering and lactation. Odent (2001) continues by questioning why humans are now relying on artificial hormonal substitutes, suggesting that women are now becoming mothers without having their brain impregnated by the naturally occurring hormones of love. He continues by asking maternity providers to urgently reconsider how babies are born, implying that disturbing the interaction between mother and baby is detrimental to humanity's capacity to love (Odent, 2001).

The extensive literature reviewed was overwhelmingly positive with regard to the effect of water immersion during childbirth. Water immersion was associated with

decreased rates of perineal trauma, low episiotomy rates, low rates of analgesic use, lower forceps and vacuum deliveries coupled with increased maternal satisfaction of the experience of childbirth (Alderice & Marchant, 1997; Beech, 1996; Brown, 1998; Burns & Kitzinger, 2000; Cammu et al., 1994; Chalmers & Porter, 2001; Cluett, 1999; Garland, 2000; Garland & Jones, 1994; Geissbuhler & Eberhard, 2000; Gilbert & Tookey, 1999; Ponette, 1999; Rush et al., 1996; Shute, 1997; Walker, 1994).

One recommendation echoed by the majority of people writing on the subject of deep-water immersion is that further research is needed to inform practice, dispel fears and myths and allow for peace of mind. This study was born from the desire to further explore the effect of deep-water immersion upon maternal and neonatal birth outcomes and women's experience of water immersion during childbirth.

CHAPTER TWO: METHODOLOGY

INTRODUCTION

This chapter will explore the theoretical underpinnings of the methodology and methods used to discover the influence of deep-water immersion upon maternal and neonatal outcomes and women's experience of water immersion during childbirth.

To address the purpose and stated objectives of the research, a mixed method was employed. This was considered to be the most appropriate to measure maternal and neonatal outcomes statistically and of identifying themes which emerged from the women's stories. The use of illustrative quotes taken from the women's stories provides an added richness and depth to the study (Crowther, Polit, Beck, & Hungler, 2001).

It has been suggested that mixed methods using both quantitative and qualitative methods allow each method to do what it does best, thus avoiding the possible limitations encountered with single approaches (Crowther et al., 2001). Monti and Tingen (1999) suggest that integration of qualitative and quantitative research advances midwifery science by celebrating the possibilities each offers in a complementary way giving flexibility, which is an advantage over using just one method. Using a mixed method enriches the study by blending both numerical and textual data which are two fundamental languages of human communication (Crowther et al., 2001; Monti & Tingen, June 1999). However combining qualitative and quantitative methods requires the researcher to acknowledge both viewpoints and provides the means for researchers to rise above the personal biases that may stem from the use of single methodologies (Rice & Ezzy, 1999).

This study is significant as it utilises a qualitative research method to investigate the phenomenon of water immersion during childbirth. This is in direct contrast to previous quantitative studies and therefore provides a fresh perspective. Sarter (1998) suggests that in a desire to attain acceptance by the scientific and medical community, midwifery researchers have adopted the dominant custom of performing only experimental/quantitative research. Mays and Pope (1995) believe this strong tradition was due to the belief that quantitative and qualitative approaches were fundamentally different in their ability to ensure validity and reliability of findings. Even today, some researchers believe that numerical measurement, statistical analysis and the search for cause and effect are the starting point of all nursing research (Holloway & Wheeler, 1996; Mays & Pope, 1995). However, it would be wrong to assume that quantitative research should take precedence over qualitative simply because it involves numbers. Continuing this tradition would lose the richness and diversity of information gained by using a mixed methodology. Take length of labour for instance, this quantitative (scientific)

measurement tells us nothing of how the experience of childbirth was perceived by the labouring woman.

Writing about 'rigorous science', Spiegelberg (1994) suggests that no matter how much science may boast about practical triumphs, it cannot conceal that there is no longer any good reason to accept this as the final answer to all conceivable questions. This view, supported by Streubert and Carpenter (1995), suggests that performing research without including the human (lived) experience can create knowledge that is not connected to the reality of practice.

To focus midwifery research purely on the scientific or objective view would be costly to both midwives and women as the human phenomenon, the woman's subjective view of how they experienced a significant life event, would be discounted. It has been recognised by midwives that women's subjective views are valued, however the difficulty is to perform research which is considered valid scientifically (Oiler, 1986; Rice & Ezzy, 1999; Streubert & Carpenter, 1999). Thus, it is reasonable to consider all methodologies available to the researcher, including mixed methods, to better address the research questions and purpose of the study. This approach may seem heretical to some who believe that purity of procedure takes precedence over a more pragmatic approach (Dey, 1993). However, it would appear that midwife researchers are now able to implement methodologies which value new ways of knowing and which celebrate the human experience of the everyday life (Nieswiadomy, 1998; Roberts & Taylor, 2002; Streubert & Carpenter, 1995), including mixed methods.

Interestingly, there are a number of paradoxes at play when using a mixed method. The researcher is required to break the data up into its 'bits' but analyse it as a 'whole', consider the data in context, but also make comparisons, divide the data into categories but also consider how they relate, perform rigorous analysis but also create meaningful conclusions. Mixed methods provide mutual enhancement of opposing approaches making this study suitable for a midwifery inquiry that can rarely be addressed by a purely scientific, experimental design or sociological method.

Research Methods

A detailed account of both methodologies chosen, and the methods used in this research, is provided in this section. This includes the sample and recruitment strategies as well as the particulars of data collection and data analysis.

PART ONE: RETROSPECTIVE CHART AUDIT

To address the purpose and stated objectives of the quantitative study, a one group quasi-experimental design was used with data being collected by means of randomised chart audit. This was the quantitative phase of the study measuring maternal and neonatal outcomes, which included demographic data, length of labour, analgesic use, and the presence of any maternal or neonatal morbidity, and to determine if the length of first stage labour correlated with analgesic use.

Retrospective Chart Audit

The method used for part one involved a retrospective chart audit with data for analysis collected from the total population of nulliparous women who used deep-water immersion during childbirth and who had an independent midwife provide their maternity care.

Part One of this research was informed, and is replicated in part by a study conducted by Otigbah, Dhanjal, Harmsworth, and Chard, (2000), who investigated the practice of waterbirth and compared those outcomes with bed births where women did not use water. The maternal characteristics of Otigbah et al's sample were similar to this study with respect to maternal age range. The data of Otigbah et al's sample were defined into two groups, nulliparous women and multiparous women. This enabled some comparison to be made between their sample and this study sample with respect to maternal and neonatal outcomes for nulliparous women.

Quasi-Experimental Design.

When testing cause-and-effect relationships, a quasi-experimental methodology is both useful and appropriate when a true experiment is unable to be performed by randomly assigning subjects without decreasing the value of the study (Beanland et al., 1999; Roberts & Taylor, 2002). In addition, a quasi-experimental design suits this study, as there is no available comparison group (Nieswiadomy, 1998). Study into the use of water immersion during childbirth is important, but one that cannot be performed by random assignment to a particular 'treatment' group. From personal experience, women who choose to labour and give birth in water often change their mind and leave the pool to birth in air. Some women who plan only to use the water for labour change their minds and remain in the water to give birth. This freedom of choice would be impossible in a randomised controlled trial, as Kidder (1991) suggests women are not "accustomed to being randomly assigned to treatments except in the case of an announced lottery" (Kidder, 1991, p.56). The nature and scope of the study were reasons why a true experimental design could not be used. Philosophically, women should have the right to

choose to use deep-water immersion, and not be 'assigned' to a particular group. In addition, true experiments may show no bearing on what is happening in the real world and can forfeit external validity because the subjects are aware of their random allocation (Kidder, 1991). Quasi-experiments on the other hand permit the natural selection process to occur as it would in real life (Kidder, 1981; Kidder, 1991; Nieswiadomy, 1998). Women who use deep-water immersion during labour are a naturally occurring and self-selecting population of labouring women. This view is supported by Beanland et al (1999) as many phenomena cannot be subjected to experimental methods (Beanland et al., 1999). Thus research is reliable when findings are repeatable and replicable (Beanland et al., 1999; Roberts & Taylor, 2002). Consequently, consistency of findings across many studies helps support a cause-and-effect relationship. Enkin, et al. (2000) consider that bias may mask the real differences between alternative forms of care, or as Beanland et al. (1999) suggest "differences exist when, in fact, they do not", thereby distorting the data analysis results (p.7).

Although this study is unable to compare bed births with water or air births with water, the outcomes of nulliparous women who used deep-water immersion during childbirth may provide useful information for midwifery practice and expand consumer knowledge.

Sample

A random sample of fifty women (n=50) from a population of two hundred and forty (n=240) nulliparous women was selected from the birth register of two independent midwives. Random selection was achieved using a table of random numbers obtained from Beanland, Schneider, LoBiondo-Wood, and Haber (1999, p.273). This method was considered the most suitable for this investigation as statistical sampling procedures using random numbers arranged in order are guaranteed not to contain bias (Becker, 1998). That is, there are no patterns in the numbers selected that gave some people a greater chance of being chosen (Nieswiadomy, 1998). Becker (1998) and LoBiondo-Wood and Haber (1997) describe random sampling as a technique designed to give a representative picture of the population, in this case nulliparous women who used water immersion during childbirth, without being selective. Random sampling reduces the risk of the researcher influencing the 'sample', as it is not subject to conscious bias.

Data Collection Instrument

The data collection tool contained eighteen items. This instrument was in an electronic format to reduce the incidence of transcription errors that may occur when data is transferred from paper to electronic format. Prior to data collection, the tool was piloted.

This involved discussions with academics that possessed expertise in this area, in addition to consultation with a statistical and electronic computing consultant.

Items 1,2,3 and 8 included demographics such as maternal age, parity, and gestation. The remaining items addressed maternal and neonatal outcomes such as length of labour, perineal status, analgesic use, Apgar score, and infection. Each item was numerically coded, for example Gravida/Parity were coded as 1 = Gravida one parity zero (G1/P0), and 5 = Gravida five parity zero (G5/P0). (Appendix A).

Method

Ethical approval was gained to conduct the study, and permission sought to access client records before data collection commenced.

Two independent midwives who had experience caring for women who used water immersion were approached seeking permission to access client records. The records of nulliparous women only were selected from the total population of nulliparous women and were allocated a number between one and two hundred and forty. One equals the earliest date of birth and two hundred and forty the most recent birth. Fifty cases were then randomly selected using a table of random numbers obtained from Beanland, Schneider, LoBiondo-Wood, and Haber (1999, p.273).

The charts were audited and the relevant information was entered electronically onto the database. Each item was defined, labelled and assigned a numeric code producing 'ratio' data considered to be of the highest quality (Nieswiadomy, 1998). These data were transformed into a useable data file enabling the results (output) to be interpreted and descriptive statistics produced (Coakes & Steed, 1997). This process involved directly entering data into the computer electronically thus reducing double handling and transcription errors.

Following data collection and transcription, the 18 defined variables were analysed using the Statistical Package for the Social Sciences (SPSS") version 10 for Windows.

Validity

Undertaking scientific research that demonstrates its integrity through rigour and consideration of internal and external validity, is an important mechanism to ensure an ethical research process (Roberts & Taylor, 2002). External validity is the degree to which the results of this study may be generalised to other women in other settings. Kidder (1991) suggests that research is valid when it can show what is true beyond the narrow limits of the study and suggests that a quasi experiment is the one most easily used when

studying retrospective (archival) data from a client's history. Returning to the original question, the influence of water immersion upon the outcomes and experience of giving birth can prove useful when making an objective assessment of external validity. This will help determine one way or the other if it is reasonable to assume that the same results could be replicated using different participants at a different time (Nieswiadomy, 1998).

Quantitative research is said to possess internal validity if it measures what the tool is designed to measure. Studies lack internal validity when there are other explanations available for the outcomes achieved or the researcher is unable to make clear a cause equals effect statement (LoBiondo-Wood & Haber, 1997; Nieswiadomy, 1998; Roberts & Taylor, 2002). There may be many plausible alternative explanations for the results seen, however, to achieve internal validity it is important that causal relationships are accurately identified (Kidder, 1991; Nieswiadomy, 1998).

In attempting to enhance validity, a random selection of 50 nulliparous women from the total population of 264 women who used water during childbirth, ensured more women were recruited than the study assessed, thereby providing a representative picture without being selective. Quasi-experimental designs with many variables (data points) help rule out some of the threats to external validity due to the number of variables collected (Kidder, 1991). This study examined eighteen defined variables. (Appendix A).

One of the difficulties of quasi experiments is that the researcher may be unable to untangle the effect of water immersion from other rival effects such as continuity of care by a known midwife and the birth environment, a dilemma encountered conducting this study. Continuous midwifery care is considered 'best practice' and recommendations made that all pregnant women at low risk of complications should have a midwife as their primary carer (Mercy Hospital for Woman Southern Health Service and Women's & Children's Health Service, October 2001).

Quasi experiments enable interpretation of data and infer possible cause and effect even without random assignment (Kidder, 1991; LoBiondo-Wood & Haber, 1997). Kidder (1991) suggests though, that quasi experiments are a 'compromise' between maximising internal and external validity, whilst also providing an element of external validity that true experiments lack.

PART TWO: QUALITATIVE PHASE

Explore Women's Experience of Using Deep-water Immersion During Childbirth

Part two of this research was informed by Hermeneutic Phenomenology, which was used to guide the conduct of the study, to explore women's lived-experience of deep-water immersion during childbirth. As mentioned previously, the search for a suitable methodology commenced with a curiosity regarding the influence of water immersion upon the experience of giving birth and a seeking to understand how women experienced this phenomenon. Thus began the search to find a qualitative research methodology which would best answer the question, give 'voice' to the women's stories, whilst ensuring the research would be credible, reliable and useful in practice.

An important consideration suggested by Cohen et al. (2000) is that the methodology chosen should suit the research question with consideration given to the philosophical issues surrounding the method and the methodology. Thus, the choice of methodology is determined by the nature of the research question and the theoretical framework underpinning the chosen methodology (Beanland et al., 1999). This study adopted the methodology of Hermeneutic Phenomenology which acknowledges and values the meaning human beings ascribe to lived-experience, and is considered a suitable methodology for this study as midwifery questions are often unable to be addressed by purely scientific methods (Nieswiadomy, 1998; Roberts & Taylor, 2002).

To reiterate, this study adopted a scientific approach in part one and an interpretive approach in part two. Although interpretive inquiry such as hermeneutic phenomenology does not prescribe action for clinical practice, it does however, influence understanding, as reflection on lived-experience results in knowledge of women's experience, which in turn enlightens practice (Van Manen, 1990). This cycle of reflecting upon midwifery practice to shape the future directions is influenced by sometimes competing paradigms.

Paradigms are 'world' views and assumptions adopted by particular disciplines containing set values, rules and regulations. These historically and socially-located theoretical assumptions, underpin the chosen methodology by focusing the researcher's attention on that which is most appropriate to use in order to answer research questions (Grant & Giddings, 2002). Flew, Speake and Mitchell (1979) define a paradigm as the primary way a researcher works when studying a phenomenon. Grant and Giddings (2002) suggest that paradigms are discrete, often competing research traditions. They argue that holding a particular ontological view entails also holding a particular epistemological view. This in turn "constrains" the methodology chosen due to the ways that different methodologies

express ontology and epistemology in terms of, "how-do-we-know-what-it-is-that-we-know" and, how do we gain this knowledge? (Grant & Giddings, 2002, p.12). These epistemological questions are the what, why and how, the socially constructed ways knowledge of phenomena are formed (Roberts & Taylor, 2002).

Rather than being seen as problematic, different viewpoints are valuable and assist in deciding what type of explanation would be real or acceptable when a paradigm's unique contribution is recognised (Flew, Speake, & Mitchell, 1979). The difficulty for the researcher is to balance what is considered real or not, as a researcher's notion of reality underpins all research activities depending on the chosen paradigm and methodology (Grant & Giddings, 2002). The test for researchers is to recognise the paradigm from within which they operate to ensure that valuable lines of inquiry are not overlooked.

Roberts and Taylor (2002) suggest that midwives and nurses are "thinking workers" engaged in a job which requires them to ask questions and discover "trustworthy knowledge" since the answers generated are fundamental to the profession (p.307).

This study seeks to balance the tensions between three potentially competing paradigms from which vastly different research approaches arise. First the positivist paradigm which seeks to predict, control and explain phenomena, secondly, the interpretive paradigm which views an individual's experience of reality as 'truth' and thirdly, the critical paradigm of feminism, which openly challenges the socio-political structures which constrain 'truth' (Beanland et al., 1999; Roberts & Taylor, 1999; Roberts & Taylor, 2002). The challenge for the researcher lies in balancing seemingly opposing approaches in order to better explore the question at hand.

Epistemology explores the nature of the relationship between researcher and researched, the definition of knowledge and how it is judged to be 'true' (Grant & Giddings, 2002; Roberts & Taylor, 2002; Streubert & Carpenter, 1999). It is the philosophical study concerned with how individuals determine 'knowledge' combined with the search for 'truth', an uncertain quest resulting in various interpretations (Roberts & Taylor, 2002). Phenomenological descriptions can be challenged by another phenomenological description, as the complex lived-experience is not static, alternative descriptions may always exist (Van Manen, 1990).

Flew et al. (1979) claim that the phenomenon is in the eyes of those who experienced it, a personal reality. In other words, it is the participant's view of the phenomenon under study that the researcher is acknowledging, generating knowledge, and permitting better understanding of the nature of the experience. This view of Hermeneutic Phenomenology

is adopted in this study to reveal meaning of these women's experiences rather than to argue a point or develop theory.

The notion of reality is grounded in two epistemologies; objectivism and subjectivism, meta-ethical views that can be discussed together since any argument in favor of one is usually an argument against the other (Flew et al., 1979). Empirical scientists taking a positivist-objective approach hold the view that research into phenomena must be devoid of subjectivity in order to define what is factual. Crotty (1996) argues that reality occurs when phenomena exist as meaningful entities, independent of consciousness and experience. This positivist-scientific paradigm supports the position that cause and effect could explain all findings (Streubert & Carpenter, 1999) enabling the researcher to remain true to the object under study without interference. This raises the question, should midwifery, which is both a practical activity as well as profession, rely on science only? It is not that simple, the relationship between theoretical knowledge and knowledge obtained by practice is complicated. However, in phenomenological research the normal scientific standards of objectivity and subjectivity need to be re-appraised. They are not mutually exclusive and both find meaning in the relationship between the object and subject. This study views objective as the human body governed by the law of science and subjective as the human body complete with a conscience (Fjelland & Gjengedal, 1994). Van Manen (1990) interprets subjectivity in research as discerning and insightful, the subjective experience being recognised as more basic and real in the understanding of knowledge of women's experience than in the "classifications scientific and empiricist researchers call data" (p.112).

Adopting an interpretive approach such as used in part two of this study, required the researcher to remain thoughtful in this relationship with the world whilst differentiating between what is real existence and what is appearance. There are, however, pitfalls for the researcher. Crotty (1996) and Barkway (2001) find fault when nurse researchers fail to be critical enough in their examination and acceptance of phenomenon suggesting that a lack of subjectivity may produce merely superficial descriptions of phenomenon which may not reveal new insights (Crotty, 1996).

On the other hand, Cohen (2000) suggests this is not the case as an interpretive-subjective stance accurately captures and communicates the experience from the participants' perspective. For the purpose of this research, the interpretive lens was considered best suited to study these women's experience of deep-water immersion. This approach allows knowledge to be generated in a creative partnership between the researcher and participant and is most suitable when feminist principles also guide the study. Furthermore, this appeared the most suitable approach for conducting research

with individuals whose reality is subjective, and socially and mentally constructed (Polit & Hungler, 1997). Reality in this phase of the study will refer to the conscious way humans experience and understand their world and their relationship with the world (Van Manen, 1990) one which exists in reality and thought.

This will hopefully provide a full and rich description that honours the women's experience of water immersion, gives women a 'voice' thus providing validation of their experience, in addition to contributing to the midwifery body of knowledge. Leonard (1994) suggests that midwifery research should focus on ontology before questioning epistemology, the question of what it 'is' to be a human is a radical shift in the debate on the nature of science and knowing-what-we-know.

Conducting a Credible Study

To establish a credible study, researchers must ensure that those participating in the study are identified and described accurately, thus laying an 'audit trail' explaining where the research is going and why it is going there (Holloway & Wheeler, 1996). Replicability is seen as a valuable aspect of quantitative research in contrast to qualitative research, which cannot be defined and evaluated in the same way due to differences in the method (Webb, 1992) and midwives engaged in qualitative research have few guidelines for dealing with these issues (Hall & Stevens, 1991). An alternative description to describe rigour in qualitative research may be to use 'credibility' as a criterion in which one attempts a faithful description or interpretation of the stories and which in this study give women a 'voice'. These women's descriptions could then be recognised by others who shared that experience as their own (Guba & Lincoln, 1981).

Therefore, auditability has been proposed as a way to ensure a study is credible. Thus researchers must produce a 'trail' which may be scrutinised by others to determine the consistency of methods and processes used in the study (Roberts & Taylor, 2002). Demonstrating and justifying the logic used to inform the research whilst remaining faithful to the women's stories makes this research credible, or as Hall and Stevens (1991) suggest, 'dependable', the goal being, to enable other researchers to follow the trail by the use of a similar approach (Beanland et al., 1999).

Many contemporary researchers question the value of positivism when studying human experience as objectivity, manipulation and removal of bias defies authentic human lived-experience (Holloway & Wheeler, 1996; Roberts & Taylor, 2002; Streubert & Carpenter, 1999). A difficulty with the positivist perspective is this approach may result in flavourless, shallow concepts of the experience, which, fail to adequately describe the phenomenon of water immersion, will not add depth to understanding or gainfully add to contemporary

practice. For this reason, this study will use both quantitative and qualitative methodologies and acknowledge the researchers role as a co-participant in the research. It is impossible that human experience research can remain truly objective; researcher experience and background will always impart influence on the phenomena under study (Streubert & Carpenter, 1999).

The interpretive-subjective stance on the other hand values as important individuals' lived-experience and the existence of phenomena in order for the researcher to truthfully represent lived-experience (Streubert & Carpenter, 1995). Thus, phenomenological descriptions are validated when the reader recognises something in the text that says 'yes', I can identify with that experience.

Consequently, this Australian research is timely, due in part to the scarcity of Australian research regarding the effect of water immersion upon childbirth. Knowledge about potential beneficial or harmful effects of new therapies is an important part of providing effective care during childbirth (Enkin et al., 2000). The Code of Practice for Midwives in Victoria (1999) provides guidance to midwives in respect of their responsibilities stating that "Each midwife is responsible to ensure … analysis of current literature and research and the incorporation of findings into practice" (Point 4.3). Furthermore, "Each midwife has a professional responsibility to identify policies, procedures or practices that are restrictive and/or may be detrimental to the standard of midwifery practice and woman centred care. In identifying these issues, midwives must act to ensure they are brought to the attention of the relevant authority" (Nurses Board of Victoria, February 1999).

This clearly gives personal responsibility for every midwife's practice to be reflective and evidence based. Yet often midwifery practices are based on old knowledge, workplace culture, myth and rituals, and not evidence (Beech, 2000; Bertram, 2000; Doering, 1992; Enkin et al., 2000; Goer, 1995). Comprehensive safety of mother and baby becomes the primary concern when introducing new or controversial therapies into an existing workplace. As well as providing for client satisfaction, the literature suggests that the use of water for pain relief is a new therapy, which should be scientifically evaluated.

As discussed previously, when undertaking a retrospective chart audit of maternal and neonatal outcomes, a quasi-experimental methodology was considered the most appropriate to best evaluate the effect water may have had upon the objectives of this study (LoBiondo-Wood & Haber, 1997; Nieswiadomy, 1998; Roberts & Taylor, 2002). The existing data, although documented for other purposes, were used to determine the possible effect of water immersion upon birth outcomes. Hence, an ontological phase

was undertaken to determine what was perceived as real by these women when reflecting back on their experience of being immersed in the water.

Ontology is an inductive process where language is constructed and interpreted underpinning research activity by determining how knowledge will be constructed and generated (Grant & Giddings, 2002; Roberts & Taylor, 2002). Ontology differentiates between what is 'real' and what is 'appearance', by investigating the study of existence itself (Flew et al., 1979; Roberts & Taylor, 2002). Human beings have an intimate and conscious relationship with the world, and this interaction is both subjective and objective (Van Manen, 1990). Objectivism assumes the world is ordered and rational (Flew et al., 1979) with reality viewed as objective when it can exist independent of experience or conscious thought (Crotty, 1996). Subjectivism on the other hand reveals reality upon reflection, understood in terms of lived-experiences and existence in accordance with feminist principles. This makes hermeneutic phenomenology a suitable methodology to answer an ontological question such as women's experience of labouring in water, and is the rationale for this choice of methodology.

It is imperative to note however, that embracing subjectivity does not excuse the researcher from conducting a rigorous, trustworthy study (Crowther et al., 2001). Disclosing any researcher bias whilst accurately interpreting and reflecting the participants' stories is a serious ethical responsibility of the researcher (Beanland et al., 1999). Whilst maintaining the integrity of each story has been proposed by Grbich (1999) as a way to ensure credibility in research, Crotty (1996) suggests that maintaining a credible study is also dependent upon what method is used and how the researcher justifies this choice, since the chosen method influences what kind of information researchers believe will be achieved. Choosing a feminist perspective to provide guidance, whilst also respecting the women who were participating voluntarily in this study, helped ensure ethical researcher conduct. Ethical conduct respects participant self-determination, treats all participants justly, and seeks to cause no harm, whilst respecting the participants' life-worlds. These are basic ethical principles when conducting research (Beanland et al., 1999) and guided the use of phenomenology in this study.

Philosophical Constructs of Phenomenology

Phenomenology has variously been described as a philosophical movement, a research method and a qualitative research methodology (Byrne, 2001; Flew et al., 1979; Piaget, 1972) first expounded in Europe at the beginning of the twentieth century by Husserl (1859-1938), a German philosopher and mathematician (Streubert & Carpenter, 1995). Husserl aimed to discover the essences of phenomena from the human's natural

standpoint as consciously experienced in his/her world (Flew et al., 1979; Piaget, 1972; Streubert & Carpenter, 1999). Many authors credit Husserl as the father of phenomenology and his work has been used as a framework for many nurse researchers using traditional phenomenological methodology (Byrne, 2001; Crotty, 1996; Yegdich, 1999). Husserl believed that phenomenology would be able to describe how experience is consciously revealed, not to contradict the scientific stance, but to complement it with a mode of metaphysical knowledge relating to the 'things themselves' (Piaget, 1972; Spurling, 1977). His mathematical background influenced his thinking as he sought a logical method to gain understanding of phenomena (Byrne, 2001).

Phenomenology is translated from the Greek 'phainómenon' meaning appearance. Thus, a phenomenon is an object or event perceived by the senses (Flew et al., 1979). It is a philosophical exploration of things within human existence possessing a common link, even between different people with differing recollections (Flew et al., 1979; Leonard, 1994; Roberts & Taylor, 2002). Consequently phenomenology is a conscious way for individuals to re-visit lived-experience, providing both authentication of the experience and an opportunity for new meanings of the experience to emerge (Palmer, 1994).

Phenomenology supports the notion that people live their lives by 'being' in the world, which in turn is influenced by their lived-experience and understanding of what they know to be real. Many authors have suggested that to undertake a phenomenological study, the researcher must 'suspend' prior conceptual understandings so as not to taint the emerging data. They believe this strategy will facilitate rigour and objectivity in research (Barkway, 2001; Cohen & Omery, 1994; Crotty, 1996; LoBiondo-Wood & Haber, 1997; Mays & Pope, 1995; Oiler, 1986; Ray, 1994). This process is called 'bracketing'. Husserl contends that this enables the researcher to objectively describe the phenomenon under study (Byrne, 2001), assuming that it is possible to separate personal knowledge when studying human experience.

This goal is open to challenge, as individuals already possess an intimate relationship with the world. Hall and Stevens (1991) assert that there is no neutral, value free position from which to conduct research supporting the view taken by Holloway and Wheeler (1996) who question whether suspending personal knowledge is achievable. This suggests that personal bias may still intrude in spite of the researcher's promise to uphold this ideal and therefore if bias can never be completely 'bracketed', one wonders if this goal is necessary or achievable when conducting phenomenological research?.

Heidegger, a contemporary and student of Husserl offered an alternate view regarding bracketing. He re-conceived Husserl's ideas, contending that through the practical and direct contact with experiences of life, human beings are already participants in the world (Byrne, 2001; Kearney & Rainwater, 1996). According to Heidegger, humans are not merely in the world, but have (Dasein) a world (Koch, 1995; Palmer, 1994).

Heidegger re-interpreted phenomenology as interpretive or hermeneutic, by applying the method to the most basic question, that of 'Being' itself, as he argued that humans are the only beings who question their own Being, or human existence (Palmer, 1994). Heidegger's ideas include the premise that humans enter the world complete with their personal biases which have been shaped by gender, background, culture and history (Byrne, 2001; Flew et al., 1979; Palmer, 1994). From a phenomenological sense, this is an essential aspect defining a human being, one for whom things in life have significance and value (Leonard, 1994). Heidegger believed that through the analysis and description of 'Being' in the world, existence could be captured and made visible through participation and involvement, neither part separated from the lived-experience in the world from which the individual draws reality (Palmer, 1994). Through this position the researcher is able to enter the world complete with her/his own set of pre-conceptions, biases and beliefs, in contrast to the Husserlian approach of bracketing (Koch, 1995; Palmer, 1994). In addition, other authors suggest that far from weakening the study, possessing prior experience supports qualitative research by the very fact that knowledge is already known about the subject under study (Ezzy, 2002; Geanellos, 2002; Streubert & Carpenter, 1999). Indeed personal knowledge may strengthen the research process by adding another dimension (Koch, 1995; Van Manen, 1990) that of the researcher's own experience as a midwife. The researchers lived-experience assisted in the direction taken when asking the research question and when the data were collected and analysed. Therefore taking a Heideggerian stance as used in this study offers the freedom from needing to suspend beliefs, since the destiny of humans is a direct result of understandings developed through 'living' life.

Hermeneutic Phenomenology

The qualitative research methodology of hermeneutic phenomenology was chosen as the most appropriate to investigate the influence of water immersion upon the experience of childbirth. Hermeneutic phenomenology seeks to understand the experience of being in the world in an attempt to disclose the fundamental meaning, thus making this philosophical and textual approach well suited to midwifery research (Crowther et al., 2001; Leonard, 1994; Ray, 1994).

Hermeneutical phenomenology is a systematic methodology used to reveal, describe and interpret the structures and internal meaning of lived-experience, hence the purpose of a hermeneutic analysis is to achieve an understanding of the phenomenon under study (Rittman, Paige, Rivera, Sutphin, & Godown, 1997). Ezzy (2002) suggests that hermeneutics is both the art and science of interpretation and has been described as a circular methodology, the action of interpreting and reinterpreting meaning in the texts (Crotty, 1996). This motion has been likened to a merry go-round where there is no obvious point of entry or exit. As a result, a full explanation is never possible, as one is always within the hermeneutic circle of interpretation (Leonard, 1994).

Discovery of knowledge that is 'Verstehen' (overall understanding) cannot be attained by the empirical-analytical sciences, according to Van Manen (1990), but is found in sharing common meanings. Van Manen (1990), a contemporary educator and researcher, asserts that a phenomenological approach is appropriate for researchers truly interested in human science to "grasp" essential meanings of the experience and therefore gain insight into the "essence" under study (p.4). This involves a process of making clear and explicit the meaning of the lived-experience by descriptive interpretation, critical analysis and refection. In a sense, the researcher protects and defends the meaning of the lived-experience (object) even while describing and interpreting it. It is foremost a written methodology which Van Manen (1990) suggests creates a text as part of the research and where descriptions form an important starting point for a deeper exploration into the meaning behind the experience of everyday living (p.1111).

Van Manen (1990) suggests two types of meaning exist in a phenomenological text, cognitive and non-cognitive. Cognitive meaning is concerned with what the text says, the language used to make social understanding possible (Van Manen, 1990). These are necessary elements of knowledge, however they are not complete in the phenomenological sense of 'verstehen'. It is the subconscious elements of the text, the non-cognitive, the evocative, expressive elements that enable the description to reverberate with the reader making the reader 'see'.

This intuitive grasp of the written text, enriches the researchers understanding of the everyday life experiences as Van Manen (1990) says lived-experience is a personal and changeable phenomenon. Analysis is possible only through reflection and interpretation of essential themes. These themes are then written and rewritten to obtain major and minor themes to shed light on the phenomenon and are achieved with the aid of philosophically situated, conceptual categories that are the 'life-world' existentials (Van Manen, 1990).

Phenomenological texts are successful when the reader can see "that which shines through, that which tends to hide itself" (Van Manen 1990, p.130) and is achieved by capturing what is written in the stories and then transforming them into core essences of the original experience, the phenomenon of water immersion during childbirth.

Van Manen's Reflective Guide To The 'Life-World'

Van Manen (1990) suggests that the structure of 'everyday' life experienced by individuals is in all probability universally influenced by four existential themes; lived space (spatiality); lived body (corporeality); lived time (temporality); and lived Human relation (relationality) (p.101). These 'existentials are drawn from Heidegger's work and form an intricate unity the "life-world" or lived world where one existential always calls upon the other in research (Van Manen, 1990; p.105). Van Manen (1990) proposes that the four existentials are inextricably linked, differentiated but not separated. Like parts of an orange, these separate pieces are also part of the 'whole' and provide helpful categories during the research process.

Phenomenology is not a set of 'steps', which, if followed, will result in completed research, although Van Manen (1990) has developed some methodological themes designed to assist textually organising the writing. He suggests writing thematically, analysing recurring themes, using examples to highlight some essential aspects, or, 'weaving' the phenomenological descriptions in a systematic attempt to uncover and describe the structures and internal meaning of lived-experience (Van Manen 1990, p.173).

Van Manen (1990) describes this as a way to unearth something 'telling", something "meaningful", something 'thematic" in the various experiential accounts, and researchers "work at mining meaning from them" (p.86). As stated previously, studies, which utilise this approach, contribute to midwifery knowledge and may provide a signpost for future investigation (Streubert & Carpenter, 1995). They may also develop theories that deal with the role of meanings and interpretations, the theories that shape how people interpret the world, however incorrect they may be (Ezzy, 2002). Therefore, as the meaning is interpreted from the text, there may be a distorted representation of reality with no right or

wrong result. At its best, this is a simplification of experience described and interpreted (Van Manen, 1990). Acknowledging these criticisms raises the question; can there ever be a universally perfect research methodology?

To discover *how* the experience of using deep-water immersion in labour affected *the lived-experience* of women, a hermeneutic phenomenological study was considered congruent with the researchers' particular interest and question of these women's experience of deep-water immersion during childbirth. The women's voices were heard through a process of story-telling, a method considered appropriate to navigate the journey of lived-experience, and not merely arrive at a destination.

This study was oriented in a participatory, non-hierarchical mode of inquiry, an honest and open relationship where the participants were assumed to be truth tellers and egalitarian cooperation was sought (Hall & Stevens, 1991). As this research involved the lived-experiences of women, it was considered most appropriate to proceed within a feminist framework to provide guidance (Crowther et al., 2001; Grbich, 1999; Polit & Hungler, 1997). Feminist research is concerned with the context of women's lives, providing an opportunity to learn more about the experience of water immersion during childbirth so that previously missing information may be included in the results (Bortin, Alzugary, Dowd, & Kalman, 1994).

This thesis will adopt the use of the first person when reporting the qualitative findings. This is considered congruent, and is in keeping with feminist principles and the epistemological underpinning of the qualitative phase (Webb, 1992). In traditional scientific writing one way to demonstrate objectivity has been to use the third person, suggesting that the researcher was distanced or un-involved. Webb (1992) views this as a flaw and argues that writing in the third person is a form of deception in which "the thinking of scientists does not appear, and they are obliterated as active agents in the construction of knowledge" (p.749). Webb (1992) suggests the use of 'I' helps the 'flow' when writing, commenting that failure to use the first person is both "deceptive and biased" (p.747), although many qualitative researchers may be uncomfortable with this position.

This raises the question, if qualitative research represents a different paradigm, why does interpretive research need to conform to the same rules governing scientific and positivist approaches?. Thus, the use of 'I' will be used as an acceptable, essential and mandatory part of writing about the qualitative phase of this research (Webb, 1992).

Feminist theorists have helped to establish qualitative research as a legitimate approach and have argued that research can be both qualitative and quantitative, the different

methods used at different stages (Campbell & Bunting, 1991; Crowther et al., 2001; Polit & Hungler, 1997; Reinharz, 1992; Rice & Ezzy, 1999). In addition, it is has been suggested that feminist research should wherever possible use research designs which combine quantitative and qualitative methods (Jayaratne & Stewart, 1991) to increase the potential for new and innovative outcomes to emerge.

This study is therefore guided by feminist principles, the researchers' own identification as a feminist, performing research, a deliberate action. Reinharz (1992) suggests this path is consistent with the anti-hierarchical nature of the feminist spirit. As research is a highly social enterprise involving the researcher's personal beliefs and values to enter the study, personal experience can then become the starting point of research, as feminist researchers often begin their writing with the "personal connection they have to the research topic" (Reinharz, 1992, p.260).

Feminist Principles

Feminist principles underpin midwifery practice; the sharing of knowledge, trust, empowerment and power (Guilliland & Pairman, 1995). In the context of this study, feminism is seen not as a method but as a perspective, where women's experiences are 'voiced' and regarded worthy of study irrespective of researcher gender. The fact that there are many definitions of feminism suggests that there are many feminist perspectives, however one shared tenet is that women's lives matter (Reinharz, 1992).

When discussing feminism in research, Grbich (1999) provides some guiding principles. These are that the research be non-exploitative, hopefully egalitarian and promote an emancipatory relationship between researcher and those participating in the research. Whilst striving for equal sharing of power is to be commended, Campbell and Bunting (1991) warn of the difficulties of sharing power equally between the researcher and the researched. They state that there will always be an un-equal balance of power despite the researcher's best intentions to remain egalitarian (Campbell & Bunting, 1991).

To ensure that the women who had volunteered to participate were not exploited at any time during the study, the researcher strove to make women feel that they were co-participants. This was achieved by ensuring that the women were telling their story at a place of their choosing, at a time that was convenient for them whilst knowing that the researcher would maintain their confidentiality at all times. The six women chosen were keen to participate, as they believed that their stories would not only be heard but would be heeded because the results of this study would be published.

Their experience of deep-water immersion would provide other women with the opportunity to learn of their experiences, and might then enable choices to be made with more confidence, because of these participants' experiences.

Midwives should advocate for women during childbirth, a time of tremendous change and vulnerability, and recognise that feminist principles guide midwifery practice (Guilliland & Pairman, 1995). Understanding the women's experience will add validity, augment the midwifery body of knowledge, and thereby contribute to the development of midwifery, providing greater choices for childbearing women (Crowther et al., 2001; Grbich, 1999). Feminism in this sense supplies the perspective rather than prescribing the method.

DATA COLLECTION: METHOD AND SAMPLE, PART TWO

Sample

Following ACU National ethical approval, a notice was placed in the magazine "Birth Matters" published by The Maternity Coalition, a national Australian consumer and midwife organisation. (Appendix B). Nulliparous women, who had used water during childbirth, were invited to make contact with the researcher if they wished to tell the story of their experience, which would then be audiotaped. Women responded to the researcher by telephone and or by e-mail. When potential participants were invited to join the research, they were provided with an information letter explaining the nature of the study. This allowed them to understand the research and give meaningful informed consent. (Appendix C). The consent to interview form was signed at the time of interview (Appendix D). The first six women who responded and who had experienced deep-water immersion during childbirth were chosen to participate, and thus provided a convenience sample. Although the stories are woman centred and presented as the woman's voice, this was not a deliberate attempt to exclude the women's partners, nor their children, They were also a part of these stories and were revealed where appropriate and important to these women's experience of childbirth.

The qualitative phase of this research entailed conducting an audiotaped, semi-structured interview with the six women. This was considered an appropriate number to interview and was consistent with hermeneutic phenomenology.

Ethical Considerations

Ethical considerations must be addressed in all research studies be they qualitative or quantitative (Holloway & Wheeler, 1996). The rights of individuals taking part in research must be respected whilst also ensuring that no harm is done and active good is seen to ensue throughout the study period (Roberts & Taylor, 2002). This process requires the researcher to apply recognised principles to protect the study participant's privacy, whilst ensuring informed consent is obtained, confidentiality maintained and harm avoided (Holloway & Wheeler, 1996; National Health and Medical Research Council, 1999). In addition the study must comply with the Code of Ethics for Nurses in Australia (Australian Nursing Council et al., 2002).

To publicly demonstrate that these general ethical standards were observed, the research proposal was submitted to the Australian Catholic University's Ethics Committee for review and approval. To reiterate, the ethical issues discussed in this proposal adhered to the principles of autonomy, non-maleficence, and beneficence. These encompassed

ensuring participant anonymity, gaining informed consent, maintaining confidentiality, and disclosing to participants any possible consequences of participation in the study. Informed consent was negotiated as an ongoing process throughout the study as proposed by Beanland et al (1999), and the opportunity for the participants to withdraw at the time of interview was presented to them in case their circumstances might have changed. This established a relationship of trust and respect, characteristic of the ethical conduct of research (Beanland et al., 1999), and was achieved not merely by verbal consent but also in writing, through the assistance of a plain language statement 'Information letter to participants' (Appendix C) along with the consent form (Appendix D). The women were only asked to sign the consent form once the researcher was satisfied that all necessary information had been given and any questions answered.

Each participant was reminded prior to interview that she was free to withdraw at any time without reason and was also provided with an opportunity after interview to listen to the audiotape. Only one participant wished to 'hear' her story, the reason given was to ensure that her voice was clear on the tape. After the tapes of interview were transcribed, each participant was invited to review her 'story' and make changes to the content if she felt it necessary. Some participants requested their story be sent to them via E-mail. Confidentiality was maintained by first sending a test E-mail which they were personally required to answer before the story was sent as an attachment protected by a password. After analysis of the stories was completed, the women were again asked if they would like to read the researcher's interpretations and to make further comment.

The women were also given the option of choosing their own pseudonym for the stories to maintain confidentiality throughout the study. The names chosen are: *Tully, Daisy, Claire, Molly, Ellie and Rosa*. *Daisy's* daughter was also given a pseudonym and has been called *Blossom* in this study.

Whenever the transcripts of interview were not being analysed, they were stored in a locked filing cabinet in the researcher's house along with computer records, a copy of which was saved onto a computer disc and protected by a password. At the conclusion of this study, these items will be stored for a period of 5 years at Australian Catholic University. In addition, the professional audio typist returned all written material and audiotapes to the researcher and did not make any copies of the transcribed material. No woman's name, record number, address, nor identifying characteristic was collected and confidentiality was maintained throughout the study.

Data Collection Story Telling

The method of story telling was adopted as the means of data collection as learning is largely thought to occur within the context of story (Leight, 2002). In addition, storytelling effectively involves participants in the research and enables data to be gathered easily (Roberts & Taylor, 2002). Minichiello (1999) suggests that possessing a conceptual understanding of the phenomenon under investigation is important when research involves story-telling, as familiarity helps develop a rapport during interview and is beneficial when developing an interview guide (Minichiello, 1999). This fits with midwifery's long oral tradition where stories are used to share knowledge (Belenky et al., 1986; Geanellos, 2002), and forms a dynamic action between listener and storyteller. This method of data collection had great appeal as a way of giving the women a voice so that they were able to find their own 'voice', thus honouring their stories. Asking women to tell their story provided a reflective description of the experience and allowed both the researcher and the women to consciously access the lived-experience. In addition, stories are a skilful way to make practical knowledge visible by providing a dialogue that reveals situated understanding of the birth experience of women who used deep water immersion during childbirth (Smithbattle, 1994). Furthermore, stories can encourage and challenge midwives to consider their practice in light of the meanings disclosed therein. Acknowledging the fact that these women had something to offer demonstrated trust and respect regarding the value and meaning described in their stories (Stuhlmiller, 1994). These stories provided the data for analysis.

After an introduction and explanation, each woman was asked to focus on her labour and birth, in particular the time she spent immersed in water. The purpose of this was to describe in detail her own birth story. One leading, semi-structured and open-ended question was asked; **"Tell me the story of your experience of labour and birth, in particular the time you spent in the water".** Asking questions in this manner has been said to encourage story communication and is an important way to maintain the pace and flow of the interview whilst also providing a focus and direction for the participant (Minichiello, 1999). In a way the phenomenon under study partly established the direction the interview took (Geanellos, 2002). Depending on the amount of descriptive information given, in some cases it was necessary to ask clarifying or probing questions. For example **"Tell me more", "Can you give me an example?"** or **"When you were out of the water did you notice any difference between being in the water or out of it?"** These impromptu and clarifying questions demonstrate research credibility as this reflects accurately the participants' reality and require the interviewer to remain mentally alert at all times (Beanland et al., 1999; Minichiello, 1999).

In preparation for hearing the women's stories, time was spent considering the interview process and included a quiet time to focus on the question to be asked. This was consistent with Van Manen's (1990) suggestion that analysis commences with the language of information gathering. Remaining focused was an essential part of the interview process demanding concentration and careful listening to the women's stories whilst adhering to the goal of maintaining the feminist spirit as described by Guilliland and Pairman (1995).

Each interview was unique and seldom predictable requiring an 'analytically attentive' attitude to ensure the process was dynamic (Minichiello, 1999). To conduct an interview in a passive manner without engaging the participants may lead to possible loss of opportunities to identify and pursue important themes emerging from the data (Minichiello, 1999). As the interviews progressed, knowledge of the women's experience of water immersion was partly revealed as the stories unfolded, and analysis began to take place within the framework of hermeneutic interpretation utilising Van Manen's (1990) guide to reflection of the life-world existentials. This lived-experience formed the basis for exploring the women's perceptions of the phenomenon of water immersion, drawn from their own reality as they had lived it (Van Manen, 1990).

The following chapters will present the results and discussion generated from this study. Chapter Three will present part one, (maternal and neonatal outcomes of water immersion during childbirth) and Chapter Four will present part two (explore the women's stories and the interpretation of the data arising from these stories in order to learn more of the phenomenon of deep-water immersion during childbirth).

CHAPTER THREE

Birthing Outcomes: Results and Discussion

This chapter will focus upon the presentation of the results gained through the retrospective chart audit and relates to the demographic data and objectives of the study. These were:

1: Determine the possible effect of water immersion upon birth outcomes such as:

Length of labour.

Analgesic use.

Maternal morbidity.

Neonatal morbidity.

2: Determine if the length of first stage labour correlated with analgesic use.

Furthermore, this chapter contains an in depth discussion of the findings and their relationship to the literature.

Demographics

Age

From the sample of 50 nulliparous women, the minimum age was 20 years and the maximum age was 39 years. The mean age in this study sample was 29.92 years.

The minimum age in Otigbah, Dhanjal, Harmsworth, and Chard, (2000) sample of primiparous women was 18 years and the maximum age was 39 years. The mean age in their study was 26.9 years.

There is a recognised trend in both Australia, and world wide for women to delay childbirth. This aging nulliparous population may account for the difference in the mean age of participants in this study (Perinatal Data Collection Unit, 2001). This difference may also be due to the cost of employing a known midwife to provide continuous midwifery care, which is not available through Medicare or may be associated with a different population of women from those who choose to attend a hospital for childbirth.

Gravida

All women in this study were nulliparous and this was part of the selection criteria for this study. There were no specific data collected by Otigbah, et al, (2000) regarding previous pregnancies as all women giving birth to their first child were classified as primiparous. Their study included both primiparous and multiparous women.

Place of Birth: Air or Water

From the sample of fifty women, the place of birth was slightly weighted towards birth in water. Fifty-eight percent (n=29) of women gave birth in water and forty-two percent (n=21) gave birth in air although all women used deep-water immersion at some stage during childbirth.

Objective One

A: Determine the possible effect of water immersion upon: Length of labour.

The minimum length of 1st stage of labour for all births was 2hrs 30 minutes with the longest labour being 28hrs. The mean length of labour for women in the sample was 10hrs. The mean length of first stage of labour for women who gave birth in air (n=21) was eleven point four hours (11.4hrs) compared to women who gave birth in water (n=29) who had a mean length of labour of eight point nine hours (8.9hrs).

The mean length of 2nd stage of labour for women in the sample was 1 hour. The minimum length of 2nd stage of labour for women in the sample was 14 minutes with the longest being 5 hrs.

(Table 1 & 2).

Table 1: Length of labour

	Minimum	Maximum	Mean
Length of 1st stage (Hours & Minutes)	**2.30**	**28.00**	**10.00**
Length of 2nd stage (Hours & Minutes)	**0.14**	**5.05**	**1.04**

Table 2: Length of labour and place of birth

Length of Labour 1st stage

Place of birth	Mean	Minimum	Maximum
Birth in Air (Hours & Minutes)	**11.4538**	**4.40**	**28.00**
Birth in Water (Hours & Minutes)	**8.9486**	**2.30**	**26.00**

Length of Labour 2nd stage

Place of birth	Mean	Minimum	Maximum
Birth in Air (Hours & Minutes)	**1.4129**	**0.14**	**2.51**
Birth in Water (Hours & Minutes)	**2.0721**	**0.15**	**5.05**

Otigbah, et al, (2000) reported that primiparous women in the water-birth group had a significantly reduced length of both the first and second stages of labour compared to the

control group. The total length of labour reduced by 90 minutes in the primiparous water-birth group. This difference was not demonstrated in the multiparous group.

To the contrary, Eriksson, Mattsson and Landfors (1997) found that women who entered the bath before a cervical dilatation of 5cms or more had a slightly longer labour than those in the late bathing group. They found that in the early bath group, the time from established labour to birth was 9.8 hours and 8.5 hours in the late bath group. This study did not distinguish between nulliparous and multiparous women and women were only able to remain in the bath during first stage of labour (Eriksson, Mattsson, & Ladfors, 1997). This apparent contradiction prompted Garland and Jones (1994) to perform a retrospective chart audit finding that the mean (2.95hrs) and median (2.66hrs) duration of labour in nulliparous women was considerably lower in the waterbirth group compared to the control (Garland & Jones, 1994). This finding was present in both nulliparous and multiparous women and was confirmed by Cammu, Clasen, Van Wettere and Derde (1994) who reported that there was faster cervical dilatation in all women in the bathing group (Cammu et al., 1994). Rush, Burlock, Lambert, Loosley-Millman, Hutchison and Enkin (1996) supported these positive findings reporting that water immersion shortened the length of labour regardless of parity.

Regarding the length of 1st stage of labour, this study of 50 nulliparous women found that the mean length of labour for women who gave birth in air was 11.4hrs and 8.9hrs for the birth in water group however, it must be noted that birthing in air only indicated that the end of second stage occured outside the water as all women in the sample spent time immersed. Norrin (1997) suggests that for primiparous women, the approximate length of first stage of labour is 12-14 hours.

Regarding the length of 2nd stage of labour, this study of 50 nulliparous women found that the mean length of labour for women who gave birth in air was 1.4 hours and 2.0 hours for women who gave birth in water. Norrin (1997) suggests an average length of second stage of labour for primiparous women to be 1 hour. The mean length of second stage of labour for this research is supported by the findings of Norrin (1997).

It appears that for nulliparous women, the length of labour was shortened although Otigbah, et al, (2000) confine this difference to primiparous women only. Other studies by Odent (1985) and Burke and Kilfoyle (1995) are congruent with these findings. Deep-water immersion does appear to influence the length of labour.

B: Determine the possible effect of water immersion upon: Analgesic use.

Forty-three women (86%) used water immersion greater than one hour (1hr) for labour and was the only method of pain relief used by this group. Twenty-nine of these women (58%) remained in the water to give birth. Six women (12%) used water for more than one hour but left the pool to give birth. Only one woman (2%) used water for less than one hour. In the birth in air group one woman used inhalation analgesia (2%), two women used an opiate (4%) and three women required epidural or spinal anaesthesia (6%). In the birth in water group, only one woman (2%) used both inhalation and opiate analgesia. (Table 3).

Table 3: Analgesic use & place of birth

ANALGESIA	Birth in Air	Birth in Water	Percent	Total
No Analgesia	15	28	86%	43
Inhalation Analgesia	1	0	2%	1
Opiates	2	0	4%	2
Inhalation & Opiates	0	1	2%	1
Epidural or Spinal Anaesthesia	3	0	6%	3
Total	21	29	100%	50

Otigbah, et al, (2000) reported a statistically significant reduction in analgesic use in primiparous woman who used and gave birth in water with 32% (n=43) of women receiving no pharmacological analgesia. Of those women who requested pharmacological analgesia, 62% (n=82) used inhalants, 0.8% (n=1) requested pethidine (opiate), 2.2% (n=3) used both inhalants and pethidine and 3% (n=4) of women used various combinations of gas, pethidine, epidural anaesthetic and homeopathy. The findings of Otigbah, et al, (2000) are consistent with this study, which identified low analgesia rates in nulliparous women who used water immersion during childbirth.

A Cochrane systematic review (Nikodem, 2000) included two trials (Cammu et al., 1994; Rush et al., 1996), which suggested that labouring in water reduced pharmacological analgesic use and operative deliveries. These findings are also supported by Rush et al (1996), who found that 38.7% of women in the water immersion group did not require

pharmacological analgesia, concluding that this group of women required significantly less pain relief (narcotic, epidural) than the control group who did not use water immersion.

In comparison, 38% of nulliparous women who remained and gave birth at the Royal Women's Hospital Family Birth Centre did not require analgesia although the transfer rate for nulliparous women was 61% of all bookings. The remaining 38% of nulliparous required inhalation analgesia, 6% required pethidine, and 15% required inhalation and opiates. The rate of spinal or epidural pain relief was not specified for nulliparous women although this accounted for 19% of all transfers from the birth centre to labour ward (Family Birth Centre, 1997).

Women who are never left alone during labour, who have 'supportive' care, are able to move easily and at will, and feel emotionally and physically 'safe' during childbirth, also report diminished pain perception (Cammu et al., 1994; Lowe, 1996). This may account for the low analgesic rates reported for women who have continuity of care by a known midwife during childbirth. From this study, it is evident that women who used deep-water immersion during labour had significantly reduced rates of analgesic use. Although this was a small sample size, these results are supported by the findings of Otigbah et al (2000) and others (Burke & Kilfoyle, 1995; Burns & Greenish, 1993; Cammu et al., 1994; Cohen, 2000; Eckert et al., 2001).

C: Determine the possible effect of water immersion upon: Maternal morbidity.

Perineal Status

More than half of the women who laboured in water (n=26) had an intact perineum, this rate being 52%. Of the women who sustained a laceration, 30% (n=15) had a first degree tear that did not requiring suturing, with 12% (n=6) sustaining a second-degree tear which required suturing. The episiotomy rate was 6% (n=3) and was confined only to women who birthed in air. There were no cases of third degree tears. In addition, no episiotomies were performed on the birth in water group and women who gave birth in water were more likely to have an intact perineum or sustain a tear that did not require suturing. (Table 4).

Table 4: Perineal status & place of birth

	Birth in Air (n=21)	Birth in Water (n=29)
Intact Perineum	12 (57%)	14 (48.9%)
1st Degree Tear	5 (23.8%)	10 (34%)
2nd Degree Tear	1 (4.7%)	5 (17.2%)
Episiotomy	3 (14.2%)	0

Otigbah, et al, (2000) reported an intact perineum rate of 41% (n=54) and a tear rate of 49% (n=66) in their sample. Three women sustained a vaginal tear (2%), twenty-three women sustained a first-degree tear (17%), twenty-eight women sustained a second-degree tear (28%) with three women (2%) sustaining a third degree tear. Overall, Otigbah, et al, (2000) demonstrated a 10% episiotomy rate (n=13) in the water-birth group. However, Burns and Greenish (1993) found that there were more second-degree tears and less episiotomies in the water-birth group.

Perineal trauma rates reported by the Royal Women's Hospital Family Birth Centre for women who birthed in air reveal 35% of nulliparous women had an intact perineum, 24% sustained a first-degree tear, 30.5% sustained a second-degree tear and 12% received an episiotomy. In comparison, Price (1995) reported the perineal status for nulliparous women who birthed in air and in water. Women who birthed in water had an intact perineal rate of 55.5%, a first-degree tear rate of 19%, a second-degree tear rate of 25.4% with no third-degree tears sustained or episiotomies performed. This was compared to the birth on land group which showed an intact perineal rate of 47.6%, a 19% first-degree tear rate, 31.7% second-degree tears and a 1.5% episiotomy rate. There were no third-degree tears sustained.

Rush et al (1996) in their randomized controlled trial found that 31% of women in the water group sustained an intact perineum, 15% a first-degree tear, 14.8% a second-degree tear with 35% of women receiving an episiotomy plus or minus a tear.

Data produced by the Victorian Perinatal Data Unit (2000) provided information regarding women having their first baby, to indicate the probability of the various forms of perineal trauma, according to the place of birth. Hospital births accounted for 44.2% of first or second degree tears, birth centre rates were 45.9%, BBA (born before arrival in hospital) were 46.7%, planned Home Birth was 25.0%. Episiotomy rates for hospital births were 23.8%, for birth centre were 4.6%, BBA were 3.3% and 0% for planned home birth. The data indicate that the highest rate of intact perineum for women having their first baby spontaneously at term, was in the planned home birth group. The highest rate of episiotomy was in the hospital birth group, which also had a 1.9% rate of third or fourth degree tears.

Current evidence shows that routine episiotomies are not justified, are associated with unnecessary maternal pain and discomfort, increased the need for perineal suturing and the risk of complications to the healing process in addition to potentially harmful long term effects (Althabe, Belizán, & Bergel, 2002; Enkin et al., 2000). Compared with episiotomy, spontaneous lacerations have also been shown to result in similar or even decreased severity of dyspareunia six months after birth (Henriksen, Bek, Hedegaard, & Secher, 1992) .

Therefore, in regard to perineal status, deep-water immersion conferred a significant overall reduction in perineal trauma in this study. Although the study numbers are too small to be conclusive, these findings are however interesting. In addition, the influence of continuous midwifery care may have been another factor contributing to this result.

Maternal Blood Loss

In this study, ninety-six percent of women (n=48) had a post birth blood loss within the normal range and defined as less than 600mls (Lindsay, 1997). The exact amount of post partum blood loss has been said to be less important than the adverse effect it may have on the mother's condition (Garland & Jones, 1994; Lindsay, 1997). Overall, the minimum estimated blood loss in this study was 100mls with the maximum being 1200mls. The minimum blood loss for birth in air was 150mls and 100mls for birth in water. There were two cases (4%) of postpartum haemorrhage in the birth in water group (blood loss greater than 600mls). This amount of post partum loss did not contribute to maternal morbidity. Nonetheless, it is difficult to accurately measure blood loss in water. Diffusion makes

blood loss look greater in liquid form, and may to the contrary, become overestimated (Garland, 2000).

The mean blood loss for birth in air was 324mls and 307mls for birth in water. The mean blood loss overall was 314mls. Oxytocic use however, was not collected as part of this research. (Table 5).

Table 5: Maternal blood loss & place of birth

Minimum blood loss	Mean blood loss	Maximum blood loss
100mls	314mls	1200mls

Place of birth	Mean	Minimum	Maximum
Birth in Air	324mls	150mls	500mls
Birth in Water	307mls	100mls	1200mls

Otigbah, et al, (2000) reported three cases of postpartum haemorrhage in the water-birth group (1.3%) although a definition for postpartum haemorrhage was not given. Overall, there were fewer postpartum haemorrhages found in the water-birth group, 1.3% versus 2.7% in the birth on land group. Otigbah, et al, (2000) reported a mean blood loss for water-birth group of 1183 mls with an average of 925mls.

This discrepancy in maternal blood loss between this study and Otigbah, et al, (2000) may be due to the management of third stage. No woman in their study received a physiological third stage, and third stage was completed outside the pool. All women were reported to have active management, which requires the cord be clamped and cut immediately at birth with traction applied to the cord until the placenta is delivered. Active management of third stage been shown to disturb normal physiology, and has been linked instead, to an increase in maternal blood loss (Enkin et al., 2000). The higher rate of blood loss in this group may be due to the routine use of active management of third stage. Independent midwives do not actively manage third stage routinely with oxytocics, instead, they are used for clinical indications and a physiological third stage commonly utilised.

Price (1995) reported that the range of postpartum blood loss for nulliparous women who birthed in water was between 50 and 2,000mls with a mean blood loss of 303mls. This was compared with the birth on land group, which ranged between 100 and 1,050 mls with a mean blood loss of 306mls. This result is similar with respect to the outcomes of this study although Garland and Jones (1994) found that 6.4% of nulliparous women in the water-birth group had a maternal blood loss greater than 500mls, 5% for first stage labour water immersion and 3.8% for non immersion. Their sample also utilised a

physiological third stage. Mention is also made that this definition of a blood loss greater than 500mls is an arbitrary cut-off point and is not a reliable indicator of excessive blood loss (Garland & Jones, 1994).

Therefore, with regard to maternal blood loss, this study found that deep-water immersion did not contribute to increased rates of postpartum haemorrhage.

Shoulder Dystocia

Shoulder dystocia was not present in 47 cases or 94% of the sample. Three women may have experienced a degree of shoulder dystocia (6%) however, none of these babies required resuscitation or were admitted to a neonatal nursery following birth. Of those babies who may have shown some sign of dystocia, two were born in air and one in water. It is common practice for independent midwives to change the woman's position to facilitate wider pelvic diameters if the baby is slow to descend in second stage of labour. Some midwives would incorporate their assessment of a large baby intrapartum and actively change a woman's position at birth to facilitate birth of the shoulders. However, it is unusual to find cases of true shoulder dystocia present during labour as the underlying causes are assessed antenatally by the primary midwife and thus appropriately referred. Encouraging women to adopt positions during second stage which increase pelvic diameters, combined with optimal foetal positioning and pelvic 'body work' make true cases of shoulder dystocia unusual. This sample is normal in these respects (Table 6).

Table 6: Possible shoulder dystocia

Possible Shoulder Dystocia	Birth in Air	Birth in Water
Yes	2	1
No	19	28

Otigbah, et al, (2000) sample contained 2 cases of shoulder dystocia in the water-birth group of which one birth was subsequently completed in air. No baby in this group required treatment in a neonatal nursery. The authors note that there was no significant difference between the water-birth and control groups in relation to the incidence of shoulder dystocia.

Therefore, deep-water immersion does not appear to influence the incidence of shoulder dystocia in this study.

D: Determine the possible effect of water immersion upon: Neonatal morbidity.

Apgar score @ 1 minute

In this study, ninety-eight percent (n=49) of neonatal Apgar scores were greater than 7 at 1 minute with a mean Apgar score of 8.5 at 1 minute. (Table 7).

Apgar score @ 5 minute

Ninety-eight percent (n=49) of neonatal Apgar scores were greater than 9 at 5 minutes with a mean Apgar score of 9.6 at 5 minutes. (Table 7).

Table 7: Neonatal apgar score and place of birth

	Place of Birth	n=	Mean
Apgar score @ 1 min	Birth in Air	21	8.76
	Birth in Water	29	8.38
Apgar score @ 5 mins	Birth in Air	21	9.81
	Birth in Water	29	9.24

Assessing five vital signs in the newborn at one minute after birth and then again at five minutes after birth, an Apgar score, has been used to indicate the baby's condition with scores of 8-10 indicative of a healthy baby (Sweet, 1997). However, the value of the Apgar score as an accurate predictor of neonatal morbidity or an at-risk baby has been questioned in the literature (Cluett, Pickering, & Brooking, 2001; Garland & Jones, 1994; Johnson, 1996). An Apgar score is a subjective assessment performed by individuals and is therefore open to interpretation. Garland and Jones (1994) suggest that this traditional method of risk assessment is unreliable.

Johnson (1996) proposes that because cord clamping is delayed when babies are born in water, this does not force these babies to commence respiration immediately at birth and thus they may remain 'blue' for longer without detrimental effects occurring. In conventional deliveries, it is commonplace for the cord to be clamped immediately without waiting for pulsation to cease. In comparison, independent midwives generally clamp and cut the umbilical cord after pulsation has ceased.

Otigbah, et al, (2000) reported a mean neonatal Apgar score at 1 minute of 8.37 and at 5 minute 9.54 for the waterbirth group with no significant difference reported between the groups in the mean Apgar score at 1 and 5 minutes. These findings are consistent with this study and are similar to those of Rush et al (1996) in their randomized controlled trial.

Otigbah et al reported a mean Apgar score of 8.2 at one minute and 9.1 at five minutes in the water group.

Garland and Jones (1995) identified Apgar scores of less than or equal to six at one minute as a possible predictor of neonatal morbidity. In the birth in water group, this occurred in 4.5% of cases and in 14.2% of first stage immersion. This was compared with 13.8% of cases where water immersion did not occur. In addition, attempts to trace the relationship between low Apgar scores, birth asphyxia and the development of cerebral palsy, have suggested that the traditional method of risk assessment using an Apgar score less than 7 is unreliable as 75% of subjects who developed cerebral palsy had Apgar scores greater than 7 at 5 minutes (Garland & Jones, 1994). This poses the question of whether a mean Apgar score greater than eight at 1 minute and greater than 9 at 5 minute is of significance in determining possible neonatal morbidity. Gilbert and Tookey (1999) and others found that labour and birth in water did not contribute to low neonatal Apgar scores (Cammu et al., 1994; Cluett et al., 2001; Eriksson et al., 1997; Geissbuhler & Eberhard, 2000; Price, 1995).

This study concludes that deep-water immersion may not adversely affect neonatal Apgar scores and thus not contribute to neonatal morbidity.

Resuscitation

Ninety percent (n=46) of babies did not require active resuscitation following birth. The following four babies (8%) required only oxygen and or tactile stimulation. (Table 8).

Table 8: Neonatal resuscitation

	Frequency	Percent
No Resuscitation	**46**	**92**
O2/Tactile stimulation	**4**	**8**
Total	**50**	**100**

There was no specific data collected by Otigbah, et al, (2000) regarding neonatal resuscitation, however the Apgar scores are indicative of healthy neonatal condition at birth. The authors make mention that no baby in the study took its first breath under water and is congruent with this study. This is further supported by Gilbert and Tookey (1999), Price (1995), Geissbuhler and Eberhard (2000), Cammu, Clausen et al (1994) and Cluett, Pickering and Brooking (2001) who reported that neonatal morbidity was not increased in babies whose mothers used water immersion during childbirth. Therefore, it can be concluded that deep-water immersion during childbirth does not contribute to the need for active resuscitation of the newborn.

Infection

There were no reported cases of neonatal infection found, following birth where the mother had used deep-water immersion (100%). This finding is congruent with Otigbah, et al, (2000) who note that there were no documented cases of infection whilst the babies remained in hospital even when the mothers had ruptured membranes on entering the pool. The authors make mention of one case of maternal pyrexia post birth in a multiparous woman and who subsequently received antibiotics though cultures and random swabs taken from the pool yielded no growth. This infection was not related to water immersion nor was the cause of this pyrexia identified nor was the temperature of the mother identified. It may possibly have been as simple as a blocked milk duct or may have been due to mastitis. This is further supported by Gilbert and Tookey (1999), Price (1995), Geissbuhler and Eberhard (2000), Cammu, Clausen et al (1994) and Cluett, Pickering and Brooking (2001) who reported that neonatal infection was not increased in babies whose mothers used water immersion during childbirth.

Therefore, it can be concluded that deep-water immersion during labour and or birth does not contribute to neonatal infection.

Objective Two

Determine if the length of first stage labour correlated with analgesic use.

There was a direct link in this study made between the length of labour and increased pharmacological analgesic use. Women who had longer labours were more likely to need analgesia and those women who had the longest labour required epidural anaesthesia. This finding is supported by Price (1995), the Royal Women's Hospital Family Birth Centre (1996), Cammu, Clausen, et al (1994). Cluett, Pickering, and Brooking (2001), also state that the longest labours were more likely to require pharmacological pain relief. (Figure 1). (Table 9).

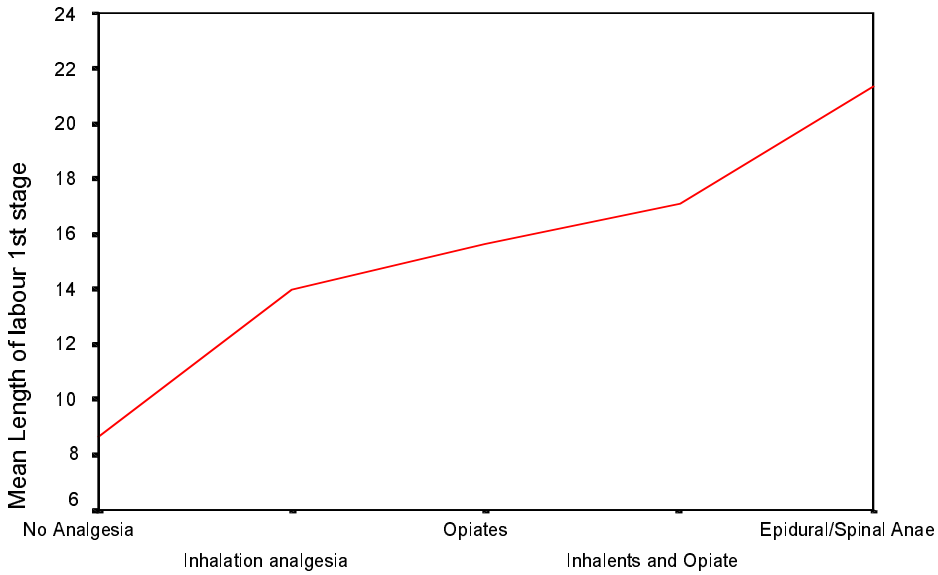


Figure 1 Length of labour & analgesic use

Table 9: Length of labour 1st stage & analgesic use

Pain Relief	Mean (hours)	n=
No analgesia	8.6891	43
Inhalation analgesia	14.0000	1
Opiates	15.6500	2
Inhalants & Opioids	17.1100	1
Epidural / Spinal Anaesthesia	21.3333	3

Summary

This study has examined in depth the outcomes of fifty nulliparous women and their babies with respect to length of labour, analgesic use, perineal status of mother, Apgar scores of babies or the presence of maternal or neonatal morbidity. It is limited by its retrospective nature in addition to the relatively small number of participants however it still enables an assessment to be made of the outcomes and safety of water immersion during childbirth for this group of Australian women, in particular length of labour and pharmacological analgesic use.

Norrin (1997) suggests that for primiparous women the approximate time taken for first stage of labour is 12-14 hours. The mean length of labour in this study was 11.4hrs for women who gave birth in air. Women who gave birth in water had a mean length of labour of 8.9hrs. Norrin (1997) suggests that for primiparous women, the approximate length of first stage of labour is 12-14 hours. Norrin (1997) suggests an average length of second stage to be 1 hour. The mean length of second stage of labour for this study was 1 hour. It appears that for nulliparous women, the length of labour was shortened, although Otigbah, et al, (2000) confine this difference to primiparous women only. Other studies by Odent (1985) and Burke and Kilfoyle (1995) mimic this finding.

With regard to perineal trauma, Enkin, et al (2000) advise that reducing these rates is an important goal for maternity providers since women with perineal trauma can suffer a significant disability, and the experience of which can dominate early motherhood. From this study and others, it appears that although there are more intact perineum's in women who had access to deep-water immersion, they sustained more minor or first degree tears (Nikodem, 2000; Otigbah et al., 2000). A commonly perceived benefit of water immersion has been that there are improved perineal outcomes for these women. Enkin, et al (2000) found that approximately two-thirds (66%) of primiparous women giving birth in hospital sustain perineal damage sufficient to require suturing.

This study showed that to the contrary, more than half of the women maintained an intact perineum with 30% sustaining a tear. There is growing support for women to sustain a natural tear rather than have a surgical cut, an episiotomy performed, as the pain and disability suffered between the two groups are similar (Enkin et al., 2000). In addition, studies have shown that reducing episiotomy rates does not inversely increase the rate of perineal tears. To the contrary, reducing the numbers of episiotomies performed actually increased the incidence and rate of intact perineum's (Henriksen et al., 1992).

The rate of episiotomy was significantly reduced in all studies reviewed with respect to water immersion and birth.

From this study and others, it appears that labour and or birth in water did not adversely affect neonatal Apgar scores (Eriksson, Mattsson, & Landfors, 1997; Geissbuhler & Eberhard, 2000; Otigbah et al., 2000; Price, 1995). In this study, the mean Apgar score was 8.5 at 1minute and 9.6 at 5minute and found no evidence of neonatal or maternal morbidity associated with water immersion for childbirth. This finding is further supported by the findings of Gilbert and Tookey (1999), Price (1995), Geissbuhler and Eberhard (2000), and Cammu, et al (1994). Cluett, et al (2001) reported that neonatal morbidity was not increased in babies whose mothers used water immersion during childbirth.

This study demonstrated that women who used water immersion during labour had significantly reduced rates of analgesic use and identified a positive correlation between the length of first stage labour and analgesic use. Women who had longer labours were more likely to need analgesia with the longest labours requiring anaesthesia in the form of an epidural. However, this study has demonstrated that women who gave birth in water did not require analgesia, deep-water immersion provided sufficient pain control for them to labour and give birth 'under their own steam' without the use of drugs. This result is supported by the findings of Otigbah, et al, (2000) and others (Burke & Kilfoyle, 1995; Burns & Greenish, 1993; Cammu et al., 1994; Cohen, 2000; Eckert et al., 2001).

With a limited health budget, these findings can have a significant role to play in keeping maternity services cost effective especially water immersion, which is both safe and cheap. Midwives can play a critical role assisting clients and peers to question the real and escalating cost of pain relieving technologies, as well as endorsing and promoting alternative methods to relieve childbirth pain (Beanland et al., 1999; Wild, 1993). Wild (1993) and Hoope-Bender (1997) suggest midwives are entrusted with screening the appropriateness and legitimacy of requests for pain medications, recommending that routine administration of analgesia should not be applied to all births. Textbooks for midwives have now included the use of deep-water immersion as a method of relieving childbirth pain whilst maintaining a calm and relaxing space for labour, acknowledging that this is a simple and effective tool which should be implemented into midwifery care (Grabowska, 2000; Page, 2000). Thus, it is imperative for midwives to provide women with information on all pain relief measures available, including deep-water immersion.

It can be concluded that deep-water immersion does not contribute to adverse birthing outcomes, in fact the statistics and literature support very positive outcomes for both mother and baby and thus showed that deep-water immersion should be an option made available for all birthing women and forms a useful basis for future research.

CHAPTER FOUR

Objective Three. Women's Experience of Deep-Water Immersion During Childbirth: The Message and the Voice

Analysing the text

During the research interviews, I asked each woman the question **"Tell me the story of your experience of labour and birth, in particular the time you spent in the water"**. This question remained central to the exploration of the phenomenon of water immersion during childbirth. This 'cue' assisted the women to remain oriented to the question (Van Manen, 1990) as well as providing them with a launching pad from which they could begin to tell their stories. At all times I was mindful of my role as interviewer while gently guiding the women, helping them to remain focused on their experience (Beanland et al., 1999). In addition, the informal nature of the interviews helped the women feel comfortable as each one re-lived her birth experience.

Due to the personal nature of the interview, a concern was raised that it may have been distressing for some women to recount their experience of giving birth. However, in reality, the interviews provided women with an opportunity to share their stories and some commented privately that they valued this time and the opportunity to be involved in the research. For example, Claire when thinking back on her birth experience cried with joy when she showed me a photo taken during labour, and said:

> *The really positive image of her [the baby] coming up to the surface and opening her eyes... that is really positive, I am going to cry.*

This is consistent with the view taken by Beanland et al (1999) who suggest that the interaction between the researcher and participant may indeed prove therapeutic for the participant. As a midwife and maternal and child health nurse with experience and training in debriefing women postnatally, I assisted the women debrief their birth experience safely without causing harm. In addition, arrangements were in place to refer any woman suffering distress during the study to an appropriate service. This provision was not required as each of the women stated they felt respected and safe telling me their birth stories. These stories provided a wealth of rich data for analysis.

The goal when analysing data, in this instance women's experience of deep-water immersion, is to determine what themes emerge, and to seek the structures making up the experience. Yegdich (1999, p.86) claims that revealing the 'essence' requires

researchers to look at things in new and different ways, and question how we learn about phenomena.

Determining what themes would emerge proved an arduous task at first, as I already possessed knowledge through previous exposure to the phenomenon. Some assumptions had therefore been made about what 'themes' might be expected to emerge from the interviews and the audiotapes, because of my prior midwifery experience attending women who used deep-water immersion during childbirth. I had heard women exclaim 'ahh,' that feels better when climbing into the bath, however I did not yet know what women meant by 'ahh'. Thus before each interview and before each reading of the transcripts I needed to clear my mind of what I suspected might result from hearing the women's stories, thereby allowing their 'voices' to speak. This process helped free me from guessing what would be said and instead, 'hearing' what was said, as openly and as truly as possible. Those prior assumptions, while impossible to fully eradicate, were then less likely to adversely colour the analysis by the act of acknowledging their existence, whilst also maintaining the integrity of the women's stories.

As discussed in the previous section, the women's stories were audiotaped, and then professionally transcribed verbatim, to increase the accuracy of the data. The transcripts of each interview were transformed into text and the stories 'sifted' (Van Manen, 1990) to uncover themes that lent understanding to the phenomenon experienced by these women. Van Manen (1990, p. 92-93) suggests a way to help the researcher isolate themes from the text. These steps are as follows:

"The wholistic or sententious approach"

"The selective or highlighting approach"

"The line-by-line approach"

Using Van Manen's (1990, p.93) "selective approach" as a focus, I searched the text for words or sentences that pointed to specific meanings from which I was able to develop and form conceptual categories, which appeared to capture the themes of the phenomenon of water immersion during childbirth. In conjunction with searching for specific elements within each story, I was also engaging with the whole story, an attempt to capture overall meanings of the phenomenon (Geanellos, 2002; Van Manen, 1990).

As asserted by Van Manen (1990), the first step involved reading the text as a whole in search of a particular phrase or sentence, which appeared to capture the fundamental meaning. The second step involved reading the text out-loud whilst asking myself what statement or words described the phenomenon. These were then circled. The third step involved reading the text in detail, line by line whilst asking what does this sentence reveal

about the phenomenon or experience being described? By reading and re-reading each transcript, I began to get an overall sense of the 'whole', not only from the stories themselves, but also through the common links between each interview, broadened by the other women's' description of similar experiences.

Interpretation of the stories began by connecting the information I heard during the interviews to that appearing in the text, all the while searching for themes, phrases and words that re-occurred throughout all the women's stories. I was listening to the women's voices as they told me their stories and re-listening when I read the transcripts of their stories as text.

It was important to remain true to the women's stories when the data were analysed and 'converted' into text (Koch, 1995). This was quite an overwhelming and intimidating experience at first, until I became immersed in the general sense of each story. These individual interviews are complete stories in their own right nevertheless, when put together the story is enhanced, illuminating aspects not found in the 'separate' stories.

It is important to stress the fact that these themes are at best a representation of the experience and my goal during this process was not to over simplify or trivialise the data rendering it with little depth or meaning. It was also difficult at times to know what it was I was looking for, as my own experience caring for women using water tended to colour my view. When I refrained from predicting what major themes I thought would emerge from the data and began instead to identify the 'actual' themes, I was able to look more clear-sightedly at the data.

Four themes were identified from the women's stories:

1: The Shape of Water

2: Warping Time

3: Water's Embrace

4: Naked but Clothed

These four major themes have also been clustered with some minor themes arising from the data, further clarifying the description and moving towards an interpretation of the deep sense of shared knowledge and wisdom regarding women's experience of deep-water immersion during childbirth.

This section has outlined the processes, and inquiry, which informed the study so far. A detailed description and interpretation of the woman's stories follows, linked by the four major themes arising from the transcripts. To conclude, I will discuss these interpretations using Van Manen's four 'lifeworld' existentials as a theoretical framework in an attempt to

make them meaningful, providing an understanding of the phenomenon of deep-water immersion during childbirth as captured in the text.

Italics are used in this thesis to facilitate and highlight the women's' 'voice' throughout thus helping to make these women visible to the reader.

Theme 1: The Shape Of Water

The following stories describe how the 'shape of water' changed the sensation of labour and birth and the relationship the women had to the space in which they gave birth. All six women remarked that they believed it was being deeply immersed in the water that affected their physical and emotional experience of labour, as well as the intensity and duration of the contractions. This was a consistent and common thread linking each story. The women described how they experienced a difference in their perception of pain between contractions in the water and out. Daisy and Claire said the difference was:

> *A different sensation...like a different shape in my body. The contractions took up a different amount of space in my body (Daisy)*

> *It was like I had this square that I was working within and I could work out one end, or whatever, and it was I don't know what kind of feeling...it was interesting. (Claire)*

I asked Claire and Daisy to elaborate on their description of the shape of water and how they thought this may have affected their contractions. Both told me that water affected both the physical and emotional relationship with the pain they experienced.

Claire told that when labouring on land she found herself getting very emotional and worked up about the pain and had tried a number of other strategies to help her cope. Relating her experience prior to entering the bath she said: *I tried to rest on the bed between contractions and used the wheat pack, but I was having trouble dealing with the pain. But getting in the pool was like ahh…the water was a real relief and eased the pain [and] I didn't feel pregnant.*

Claire laughed after she said this as she had enjoyed being pregnant so for her it was being immersed in the pool that made the difference to coping or not. It was the: *Actual water, the depth and the warmth [and] the safety.*

Daisy reflected that it was difficult to put into words this different experience of pain between being in the pool and out. Whilst hard to describe, the sensation of labour was changed and she said: *I think when I was in the water the contractions took up less space.*

Daisy also mentioned that when she was out of the water, the contractions had felt different and were more painful. She believed this was because water changed the shape

of the contractions she experienced, and likened this to being in a bigger space. She said: *When I was out of the pool there [was] such a big expanse of space around me, that the contractions took more effort [for me] to deal with, whereas the water just shrunk everything down.*

Daisy elaborated on this with her evocative description of the difference, reflecting:

> *I suppose it is more like that distance between if you are standing out in the middle of a desert, compared to standing in a forest. Like it has a really different presence, and you can really feel different. You can feel vulnerable in the open but in the pool, you are in a closed space where you can feel safer.*

Daisy also felt the water helped her focus and deal with her contractions: I was in that space and [the water] helped me only focus within that space.

Ellie also identified that deep-water immersion changed the sensation of labour and birth, and this then changed her experience of pain. She spoke of how she had been labouring in the shower before entering the pool but said:

> *Once I was in the pool, the sensations I was having changed completely so the pain I was experiencing did diminish.*

Ellie also questioned whether labour pain could ever be completely eliminated. She said that the relaxation provided by the water changed how she experienced the 'shape' of labour and therefore being immersed in the water. She reflected that: *Being in the water must have eased the pain.*

She wondered if this was an 'unconscious' reflection as she recalled one time during labour she had been out of the pool and remembered how eager she was to get back in:

> *I was very keen to get back in, to get back to that place... I didn't consciously feel [the water] easing the pain but it was probably the reason I wanted to get back in...It was far more comfortable being in the water and being supported.*

Tully's story also described her experience of labour, and the amount of pain she was experiencing on land while the pool was being filled. Water, she told me, changed the shape of the sensations she was feeling: *Before I got into the pool, I just had heat packs and stuff but once I got in, just the feeling! …I mean the pain was there but it wasn't as bad...*

Claire noticed that there was a difference in how her labour felt on land and in the pool, as water also changed the sensation and shape of her labour and affected the pain of her contractions.

Claire also stressed the point that once she had climbed into the pool, it then became *'her'* space as she claimed her territory:

> *In the pool the contractions were not as painful, the water diffused the pain…I felt that there was no way I was going to get out of the pool once I was in it…and it was my space, I didn't want anyone in there with me even though I had watched videos where the partner was there, I didn't ever consider that to be important once I was labouring in the pool.*

Tully found that in addition to reducing the pain of the contractions, water had a shape reminiscent of home, a place she could go to that provided a feeling of, *Comfort, having my own space that I could go to, being in that one spot and feeling secure and warm…I was just able to be...to be able to float out and relax...that sort of security I felt like it really helped me to give birth.*

This was a common theme, the way that water provided a place *'to be oneself',* a private and personal place in the world where women *"could take themselves"* to.

As well, the pool was a secure space where in labour the women could intuitively be themselves. Moreover, they were also able to control who they shared this space with. The women described how they were able to manage this homelike environment, knowing without 'seeing' if someone was entering or invading their space.

This sentiment was mirrored in all of the stories, for as Daisy remarked, privacy was one of the main things that the pool provided for her. She reflected:

> *I think the main thing for me was the privacy, by privacy I guess I mean personal space, like something about the space…And because I didn't really want to be touched very much, I found being touched distracting for me when I was in labour...so having that defined space around me, the birth pool, for me meant that I knew exactly the distance that people were away from me, and I knew that there was no way people were going to move in closer without me knowing...I knew I would feel them leaning over, or I would feel their hand going in the water or whatever... So, that's probably the main thing for me was the space thing, and feeling that I was safe and protected in a way, and the water offered that to me...*

Ellie and Rosa echoed the same sense of privacy and control that Daisy had experienced in the pool. Both women mentioned early in their stories that they felt safe, private and in control being immersed in the water. I asked them to elaborate on what it was about being in the pool in particular that made them feel safe or even if there was something specific that they could recall:

> *I just intuitively knew it was OK…I guess the pool was a safe place to be, and I can't think of doing childbirth without using water. (Ellie)*

It was because the pool space was really safe…quite contained…it was dark, midnight dark…A place I could go to and feel safe, really safe…and thinking back, I am sure that made the difference. (Rosa)

Tully's story also reflected her feelings of safety. When asked to describe this feeling of safety in more detail, she replied that she felt the water was what helped her maintain control of her personal space. She said: *Having my own space, being in that one spot where I could go to…but everyone was just still around me, and if I needed them… It was just fine.*

The space in which the pool was set up was also depicted in some of the women's stories. This was an unexpected discovery.

Claire described how the small room in which the pool was situated as well as the small space within the pool, marked her territory and made her labour feel contained. She described the feelings she had being immersed in the water: *The water contained the whole thing and made me calm which was good…it felt really good to be in a small space and feel safe and in control.*

In a sense, the shape of water also spilled over into the surrounding area. In contrast to the small space described by Claire, Rosa told of labouring in the space surrounding the pool, an open and atmospheric space. She was: *In the hallway of my house with this huge thunderstorm, and a breeze blowing between my legs. I remember that really clearly and then I was able to get into the pool and there was water everywhere…there was water coming down outside as well.*

Space in which to be one's self and remain in control without 'losing it' was how Molly told her story of the experience of being immersed in the water. For her it was a:

Private, little space. Yes, I think the sort of personal space was a really great thing… It was nice to be confined and having the edges around me…I was able to be calm…I was 'cool' going through labour…I mean there were stages in labour that I was so comfortable that I could laugh and joke and be sort of happy. I wasn't angry at all, I was calm and I didn't take my frustration's out on anyone, I mean the most violent thing I did was squeeze people's hands for support.

Being immersed in the water appeared to change the sensation of labour, relieved pain, and, allowed these women to personally control their space. Indeed these descriptions were used by all six women when telling their stories. In addition, each woman wondered whether if not for the birth pool, would they would have been able to give birth so easily?.

These stories have expressed the significance for labouring women to not only experience their physical environment, to control it, but in addition, to be influenced by it.

I believe that the main theme that arose from the previous stories was the way in which water changed the shape of the contractions. This theme of the shape of water was also accompanied by sub-themes of maintaining personal control, maintaining privacy and territory and safety.

Flowing on from this theme was the effect of deep-water immersion on women's experience of time during labour.

Theme 2: Warping Time

Childbirth is a journey through time. It may be technically short or long, or may be remembered by the woman as short when in fact it was long. Whichever way we view the length of a woman's labour it is but a temporising experience, interpreted and measured by each individual in her own way (Van Manen, 1990).

Furthermore, time was expressed in these stories as the women knowing when the time was 'right' to enter the pool. This feeling of excitement and anticipation in particular, was an important part of Claire's birth story, as she sensed being impatient for the 'right time' to get into the pool, confident in her expectation because she knew she would enjoy being in the water. Claire had heard the myths that water may slow things down but she could not wait to enter the pool:

> *I remember looking forward to that time when it would be ok, to get into the water. I really wasn't anxious about what people said about getting in there, how it might slow the contractions down, slow the whole process down. But I remember thinking I can't wait to get in the pool…I suppose it could have brought my mind into more of a focus.*

Indeed Claire found that even during strong labour, she still had time to rest between the contractions: Even though the contractions were coming very close together the water made it easier to rest in between; I still had time and could rest.

Time did not appear to matter to Rosa. Labour may have been short or long but was not important to her and this sense of a 'time-warp' is captured when she says: *I remember being in the water wondering how long labour would go on, but not with a sense of anything frantic*.

These stories demonstrated how women believed that using the pool did in fact change the 'time' of labour and birth. Deep-water immersion appeared to shorten labour, not so fast that the women felt rushed or hurried, but they were aware that the length of labour was shorter in water than if they had been on land.

Rosa believed that being immersed in the water affected the length of her labour: She described her labour as being: Pretty fast, but I think it would have been slower if I had been on land from the physical exertion that I needed [to give birth].

Rosa believed that her energy levels were greater as she did not need to expend so much physical exertion to birth her baby. Water affected her memory of the length of labour.

Ellie was aware that getting into the pool pushed her labour along, not in a detrimental way, although she remarked that: It probably would have happened anyway but just getting into the pool when I did, I guess it made me go straight from first stage to second stage.

Ellie observed that for her, getting to a point in her labour when she could get into the pool would be a huge goal, something she was going to get to soon. Indeed Ellie's anticipation of entering the pool was a target for her; some sort of 'end point' in her labour, a marker of progress. Ellie says that when she entered the pool, she felt like she had reached a: *Turning point [in her labour], and it was then hard to remember the pain.*

Daisy tells of how being immersed in the pool during labour meant that time was irrelevant. She didn't have to worry about:

> *Getting set up for the contraction; and timing, just feeling that time is such a strong factor, that I didn't have to worry about the time, hurry up, get the pillows over there, or whatever. Everything was just there in a way, because the water provided half of it, I just needed to find somewhere [in the pool] to prop myself.*

Daisy was also acutely aware of the 'right time' to get into the pool. To her it was a compelling and urgent need to be 'in' the water and she reflected that:

> *There was a point where I had to get in there, and I guess it was a particular point in my labour where I went, I have got to be in that space **NOW** !!*

Although described in the stories individually, all the women appeared to have a strong intuitive desire for the time to be 'right' to enter the pool. This was also evident from their use of words to describe this unconscious urgency, to enter the water 'now'.

Claire remembered thinking: *I could not wait to get into the pool, I **needed** to get in so I could feel relaxed…*Once in the pool Claire claimed she was not going to get out.

Rosa was relieved when finally the pool was finally warm enough and deep enough for her to get in and remembered the: *Relief to get in…as soon as I knew I was pregnant I knew I wanted to use water…It seemed an intuitive thing.*

Molly's story also described her anticipation to get into the pool saying:

> *I realised that I **needed** to be in the pool…I was in active labour and just knew that it was time to be in the pool.*

Which was a similar experience for Tully who also waited in anticipation for the pool to be ready to use saying: It took time I think to fill up the pool and I was just waiting till it was full enough, then once I got in, that was it, I remained in the water until she was born.

Time took many and varied paths throughout the women's stories as illustrated by Molly who was able to transcend time during her labour, able to view it as an outsider looking on. Molly said she thought about this during her labour believing: *The water helped [her] maintain control of time.*

Rosa continued in this vein, describing a form of 'time-travel' during labour, which was facilitated by being immersed in the pool. During labour, the time warp took her to:

> *Another world…it was like by the ocean, and then you come back to land and you are in another country…They call it 'labourland'… It really was another world, and you think about the journey that you make from being pregnant to becoming a mother… An **incredible** journey*

This was Rosa's analogy of her transition to motherhood as she moved from one world to another or as she said 'labourland' and the implication of her altered conscious state. Deep-water immersion facilitated the women's ability to withdraw into themselves as labour strengthened, altering their conscious state.

Daisy beautifully describes this altered state of consciousness, reflecting:

> *Water shrunk everything down so that time stood still…there was this kind of bizarre gap in time when she was fully born, where I felt like I was looking into her soul or something, like this incredible, unexplainable sort of period of time that I have never felt before.*

Interestingly, Daisy's next birth also took place in the water. Reflecting on this time Daisy remarked that though she did not consciously do this, when remembering her daughter's birth she realised she had been able to manipulate time. She noted:

> *When her body was being born and I was actually lifting her up to me… I slowed it down, because I kind of knew that I was experiencing that incredibly special thing and I just wanted to bask in it.*

Daisy went on to describe giving birth as different forms of arrival: Not just one big arrival, there were little bits, a little bit each time, just enough for her to cope with and just enough for me to cope with.

Deep-water immersion appeared to change 'time' and thus made the experience of childbirth more manageable, as these women were able to 'cope' with labour. Each woman experienced and described this sense of 'unreal' time as they were transported during labour to another place in time. This appeared to be an innate coping mechanism.

Ellie described how she experienced warped time during her labour, noting it as 'surreal':

> *I felt like I was floating above and watching my baby being born… But then all of a sudden he was on there on the floor, and he looked like he was a really long way away, like that feeling you get when you hold your arms against a wall, and when you take your arms away you sort of float….*

Molly's story described how she was able to 'dislocate' from what was happening around her during labour but also be present 'in' the world. Labour time was warped as she:

> *Was half in my own little world and half sort of in the rest of the world so things weren't bothering me…The water being changed to keep the temperature, I really didn't notice a lot of that sort of stuff.*

The stories consistently described the lack of a 'hurry up' factor. In telling their stories the women reminisced how labouring in the pool meant that they experienced the ability to 'just be' in the moment, often taken by surprise that labour was at an end and that they had given birth.

This being 'in' the moment is evident in this beautiful description by Rosa of her son's birth. She said: I was shocked and awed and gob smacked about the reality of him being there. What I remember is having him in front of me and wanting to love him and be closer to him.

Claire was also taken by surprise at the time of her baby's birth. She had been so focused on pushing her baby out that time became irrelevant and then suddenly the time of birth was there as she squatted in the corner of the pool. At the time she says she was:

> *Feeling a bit, I don't know, shocked about the whole thing, but, it was very easy to have her close to me, yes, looking down…If I had been lying down, I would not have been able to see clearly at all. But in the pool I could look at all of her, and I could hold her, even that was really nice.*

This positive experience of the effect of deep-water immersion upon time appeared to trigger a projection in time forward to the next time they would be pregnant. Claire, Tully, Daisy and Rosa all spoke of being able to transcend the moment of giving birth and to plan ahead for to their next pregnancy. "Next time" was a common thread throughout these stories, where each woman knew that for their next labour: *Now that I have used a pool there is **no way** I would want to labour without one!*

These stories have described how women in active labour were able to warp time, manipulate it to suit personal needs. Each story told of how the pool helped them withdraw into themselves as labour became stronger. Indeed, it was as if they had given birth to new emotions. This theme of 'warping time' is possibly due to the effect of the 'embrace' of deep-water immersion during labour.

Theme 3: Water's Embrace

The physical imprint of water on a woman's skin was likened to an ***embrace.*** Water imparted warmth on the women's skin, support on various parts of her body, strength as well as gentleness. There was a 'smoothing' of the sharp edges of the contractions and was highlighted in the stories the women told. Water had an almost mercurial ability to change the physical sensation of labour by softening the intensity and helped these women relax and therefore feel that they had more energy with which to give birth. These stories also contained the sub-themes of support, strength, as well as softness. All six women described the experience of waters 'embrace' upon their skin in a positive manner.

> *The softness…In the pool the water softened the whole thing…it was gentler…all the pressure was off because in the water I felt weightless…like it is an emotional and physical support. (Claire)*

> *And also just other things, the warmth of the water, the constant water all around my body, and the softness of it. (Daisy)*

> *When I was pushing my baby out the water helped so that there were no horrible sensations…it was nothing like I expected, it was a bit tingly but not the stinging and the burning that I had heard from other women. (Molly)*

> *I had thought when I was 'pushing' that I might split open, but I didn't…the water did not put pressure on any particular place, so it's not like someone is massaging you or touching you…it was just a very gentle feel…yes, and it is supporting you in some way, you are supported by the water. (Ellie)*

The women told me how they had heard that when the baby was being born, the pain they would expect to feel at this time would be intense burning and stinging, and had made them anxious about this stage of labour. To the contrary, when immersed in the water the women discovered perineal pain was not an issue. Tully told me this was because: *The water was just so soothing [on my perineum], and the warmth, and the movement of [water] on my skin, that* ***really*** *helped.*

Rosa supported this by reflecting that being in the water: *Made a **huge** difference, [it was] soothing [on my perineum].* She continued to describe the effect of being immersed in the pool describing how: *Motion was the other [important] thing. I remember [having] this particular kind of rhythm to move to.*

When the women were asked to describe in more detail this 'freedom of movement' they all felt that water helped them achieve something they had previously identified as a difficult thing to do, that is, give birth naturally. Their doubts concerning how they would be able to manage to move in labour were dispelled once they entered the water.

Rosa said that instinctively her physical body, which she described as awkward on land, became supple and free in the water. She observed that:

> *The water **really** enables you to move in a way I wouldn't have been able to do out of the water. It was so easy to do different movements [and] being able to get into different positions more easily than the awkwardness of doing it on the ground.*

Molly also found that the water helped her surpass her natural physical ability. She was able to lose her self-consciousness in the pool and 'just move' instinctively. Water's buoyancy supported her weight as well as helped her to choose positions she claims would have been impossible to do outside the pool:

> *It was nice being able to float in the water. That was a **really** relaxing thing. I could sort of push myself backwards and forwards in a floating motion… Having my partner in the water at that end, it was a really beautiful experience, being able to share that, and have him hold me up and help, squeeze my hands, to help with the concentration.*

Not only was Molly embraced 'by' the water, she was embraced 'in' the water. The water also supported her partner when she invited him into the pool and provided a human to human touch. It is important to note that Rosa had been concerned during pregnancy that her partner would not be able to support her weight during labour. She told me how she had been described by some hospital staff as a 'large' pregnant woman, which made her self-conscious of her size. However, to her relief, the water actually enabled her to get into positions she would never have been able to achieve out of the water.

Rosa commented: As well as not having to deal with the weight of my body through each contraction, or in between, the relief from the feeling of gravity [was] fantastic. I remember my relief at being able to float...that was really huge, just the amount of energy I had.

When I asked her why she thought this was so, Rosa replied that:

> *I have got bad knees, and being in positions when I was heavily pregnant was very hard for me, doing a lot of pre-natal exercises [was] almost impossible. The water just made me more flexible. I could squat easily, I could almost sort of kneel properly on my knees with one leg up or one knee taking most of my weight, which was quite comfortable, even though it was also a little bit uncomfortable, being as big...so even if you have a contraction happening, you can focus on the contraction and not on holding yourself together...*

The ability to change positions at will and with such ease surprised many women. Claire mentioned that her midwife had suggested she change her position between contractions and she was amazed that she could actually do it:

> *It would take a lot of effort to do that now, and I am sure it would bloody hurt like hell as well…so, yes to be able to change positions between contractions without much time in between them was really easy because I was semi-weightless, I could do things like kneel with one leg up, kind of squatting...And I even had time to rest and could then get up quite quickly and go to a new position or move into the corner or whatever...so in terms of movement, the water was excellent.*

Tully also told of how her midwife suggested that she change positions during labour to help align her baby in an optimal position for birth. She said she remembered thinking;

> *Oh, how can I do this, but it was surprisingly easy…I think being immersed in the water was definitely something that helped…*

It was an unexpected delight for the women to find that they could be so supple and semi-weightless when immersed in the water.

Ellie said she was surprised and pleased that changing or adopting active birth positions, was so effortless in the water: It was so easy to kneel in the water…I could support myself better than on land because in the water it is easier to move around…In the water you don't feel so pregnant and in labour.

A strong link through all the women's stories was that in addition to ease of movement, the water also provided them with warmth, relaxation, and rest, which they described as helping them have the energy to change positions. Claire suggested a reason these were an important aspect of her labour. For her, being immersed in the water was experienced as a relaxing, calming thing to do. The pool provided a calming effect and incorporates the theme of the shape of labour.

Claire reflected:

> *The contractions were stretched out and were less difficult to deal with in the water... It must have diffused the pain…I felt relaxed…I could actually stretch out and float. That was probably essential because I could relax very quickly…I could actually stretch out and rest... Water also decreased the intensity of the contractions... Water softened the whole thing and made it more bearable…it was much easier to cope with the pain.*

Claire continued by again remarking that when out of the pool she was less able to deal with the sensations of labour, in particular the pain. Instead, she found that immersed in the water, the contractions she had been experiencing: *Were less difficult to deal with.*

Without the embrace of water upon her skin, Molly said that the pain she had experienced out of the pool had been:

> *Unbearable, I couldn't lie down, I couldn't sit down, I couldn't sit on the birth ball, I couldn't lie down on the couch, I couldn't sit on a chair because the pain got a 100 times worse… but in the pool I was able to stretch out and rest... I could sprawl out and just floating and pushing myself backwards and forwards in a rhythmic sort of motion…The pain was not so great any more...it was very relaxing...it made me more flexible.*

When telling her story, Rosa again repeated her concern in regard to her weight. Her fear of being 'too big' for her partner to support her physically during labour had been uppermost in her mind during both pregnancy and at the beginning of labour. To the contrary she discovered that instead was able to lean on her partner for emotional and physical support but not worry that she was 'too heavy' for him:

> *I remember before I went into labour, my partner who is a slighter build than me, was really worried that I would physically need him to be able to help me all the way through. He really wondered if he would or could support me, but he didn't have to...The water was a really useful tool to use, the water was great for that.*

Her fear of being 'too heavy' evaporated and she became light yet strong, embraced by the buoyancy of the water. Water's ability to assist in supporting the pregnant women's weight lightened the load giving the women the necessary strength and energy to give birth.

Molly described how the water gave her strength which she felt was the reason she had enough energy to give birth: *I mean, I know I needed a lot of strength to give birth to her, but I think I might not have quite had enough strength to do it completely on my own in that sense...*

It was not just the water women related to, the frame of the birth pool and being able to touch the sides of the pool were also important factors. This is another cross over

between water's embrace and the shape of water. The pool provided a small space to labour and feel safe and contained, as well as a large enough space to move easily. Furthermore, the frame provided a solid, grounding device that Claire likened to the bar inside a car, which you can grab in times of stress. She remembered:

> *Hanging on to the pool frame. It was like I had something to push against, we call it the 'Jesus' bar in our car. So it was like hanging on to the Jesus bar. While you are actually labouring, you have that sense of being supported is how I would imagine...it is one of the most difficult and emotional experiences in your life I guess, or challenging or whatever, and you are being held in this, like, dark enclosed place...I am sure that helped my labour.*

Rosa also reflected on how the pool frame assisted her experience of childbirth and aided her feelings of strength and power:

> *In terms of the actual practical realities of the pool too, it is actually heavy, and the heaviness of the frame was fantastic. I could* ***really*** *hold on to it.*

The physical assistance provided by holding onto the pool frame was identified by these women as a way to remain focused and in control during labour. This assistance was also noted by Ellie, who found the pool frame beneficial during labour because she was able to support herself better. In addition she noted that:

> *Holding onto the pool frame gave [me] focus and something to push against. The frame also helped in second stage, I didn't like pushing at all!*

It is very important to note here that these stories illustrated a vast difference between the experience of water upon their skin, compared to being immersed in a deep pool of water. Claire, Rosa, Ellie and Molly all spoke about their experience of being in the shower before getting into the pool and how the experience of labour was very different in each place. The depth of water in the pool was an important factor in enabling these women to feel relaxed. Being immersed in the warm water changed the women's perception of how they experienced the contractions. Each woman felt she experienced less pain when deeply immersed in the water.

Ellie was able to differentiate in her story between the feeling she experienced when she used the shower and then the feeling when she was immersed in water:

> *There was a vast difference between the pool and the shower...I couldn't get in the same positions in the shower, so I could not kneel down, I suppose I could if I had wanted to but I would not have had the pool sides to rest against.*

Molly's story included a comparison of her experience using her regular bath and then comparing this to the birth pool. She felt there was a vast difference saying that:

> *At the beginning of labour I thought I wasn't far enough into labour for the pool so I used the bath...which really didn't help with the pain because my weight was sitting on the bottom of the bath, I didn't feel enough water was across me and I was sick of it within 5 minutes and I didn't want to be in the bath any more, and the pain was really strong and that was hard to cope with...because the bath we had wasn't deep. I didn't realise, it wasn't until I spoke to my midwife that I [understood] needed to be in the pool. In the pool I was floating, I was stretching out and floating cause the water was deep enough to cover me.*

The depth of water was a significant aspect of all these stories. The consequence of being covered by the water or 'immersed' made freedom of movement possible.

Water provided not only warmth upon the women's skin, it also included the sound that water made. The sound of running water as the pool was being filled in addition to the large volume of water the pool contained, enabled women to listen to it, or run their hands through it, to feel the water flowing between their fingers and toes. In her story, Daisy described this sound as:

> *A droopy kind of noise...and sound is another thing I think the sound of water is very soothing... [it is] like bringing all the elements in.*

This was a reference in Daisy's story to the candles burning in the birth room to provide dim lighting and alluded to the fact that she was squatting in the pool to give birth, with both her feet planted firmly on the ground. The elements of water, earth, and fire.

Water was also expressed in the women's stories as an embrace for the baby. Daisy, Tully and Rosa's stories expressed a profound spiritual and emotional aspect of giving birth and described how being immersed in water facilitated their relationship with their baby.

Rosa spoke of giving birth to her baby and: *Wanting to love him and have him near me and bonding with him.*

Tully expressed that labouring and giving birth in the water for her was:

> *The sort of security I needed because I knew this baby was big. And being supported in and by the water, that helped me to birth him.*

Daisy was able to see through the water as her daughter was being born and was able to:

> *Catch a glimpse that she was a girl, between her legs...yes that openness of her body floating in the water…I was totally enjoying her nakedness...*

Claire felt that being immersed in the water made meeting her daughter perfect:

> *The way we met, both of us in the nuddy, and it was just …it felt that this was the way we were supposed to meet…Oh it was very easy to have her close to me, yes…and I watched as she was being born, the really positive image of her coming up to the surface and opening her eyes…and then she coughed and then stretched out in the water, and that is REALLY positive…I'm going to cry.*

With that Claire began crying 'tears of joy' as she told me how some of the photos taken of her in the pool holding her newborn and looking ecstatically happy, made her 'cry' to look at them it. These photos proved a powerful memento of her experience of childbirth.

Another word for embrace is to 'encircle'. This is one more example of the way women immersed in water were not only supported by the water, but were also encircled by it, a 'loving' and 'holding' circle. The midwife and the woman's partner did not need to interfere or distract the labouring woman as the water provided these women with enough physical and emotional support.

Indeed, the women describe in their stories that often they did not desire nor need the distraction of unwanted touch.

Daisy remarked that had she not been labouring and giving birth in the water she:

> *Might have considered some sort of support, like a hand there, to almost keep it together kind of thing. [however] NOT feeling that touch was necessary in the water…I didn't need anyone to hold or touch me, I could do it all myself. I didn't feel this extra stress on my body, because I had the water there holding me.*

Ellie also felt that during labour she did not need the distraction of someone massaging or touching her because being immersed in the water provided a different kind of touch:

> *The feel of water is not like someone massaging you or touching you, and you don't really want anyone to.*

Molly described a similar experience, feeling that the embrace of water was enough touch:

> *I didn't want my hand or anything touching me, or the baby's head when she was being born…I didn't want that, no.*

It appeared that water was enough 'touch' on these women's bodies making it possible for them to focus on labour without being distracted by unnecessary physical contact.

Daisy noted that the physical and emotional support of the water also offered something special to her daughter. She remarked that when Blossom hopped in the pool, she felt that the water also helped her feel a part of the birth, as she was the only person invited into the pool. Daisy felt this contact during labour prepared Blossom for:

> *A challenging experience ...she wanted to get in and she felt safe in the water...I think that was very enjoyable for her, a special thing that she did with me, she was bumped around in the water when I had contractions, another positive thing.*

'Flowing water', 'making whirlpools', a 'rhythmic sort of motion'; were some of the words women used to describe how water changed the sensation of childbirth and the experience of pain by providing an alternative focus. For some women it was a combination of immersion and flowing water or being able to manipulate the water so that it flowed over and around them as they moved. Tully's story illustrated the sensation of having water poured over her back when she laboured immersed in the pool:

> *Just the feeling of the movement of water over my back...that movement...it gave me something else to focus on, It was just so soothing and warm and the movement of it...*

Molly said that being in the pool helped her move instinctively, the buoyancy enabled her to: *push [myself] backwards and forwards in a rhythmic sort of motion, s*o that the water flowed over her body. This is akin to the dance of birth where women move their bodies, in tune with their instincts.

Daisy found that being immersed in the water imparted a particular feel to her labour that was different to her experience of labouring on land and this was important because:

> *There was constant water all around [my] body, and the softness of it.*

Deep-water immersion provided a softness that embraced both her and her baby and engendered a gentle feeling in them both. Ellie felt that being immersed in the water was:

> *A gentle feeling, yes, because the water was supporting you in some way; you are getting support from the water as it was all around you.*

This preceding theme of 'water's embrace' leads into the final theme of 'naked but clothed', the effect created by being covered by the water.

Theme 4: Naked But Clothed

Van Manen (1990) suggests we are always "bodily in this world"; if we are observed or feel the object of someone's stare we can lose the feeling of naturalness (p.104). Yet under an admiring gaze, we can become graceful and act instinctively. The following stories are filled with descriptions of women's ability to tune into their bodies and act instinctively during childbirth and just 'know' what was right for them. In the water they did not feel exposed, it was as if they were wearing clothes. The water was described as a place where women could go 'to', a place where they could automatically 'relax' and, 'be themselves', naked, unhindered and free and not feel exposed to the gaze of others. Tully remarked on how she chose for most of her labour, to adopt an *'all four's'* position and how she remained '*still'* in the pool. She experienced this as a way to help her, *"just be herself".* Because this position removed any visual distractions, she was able to remain focused during labour and as a result, felt safe and secure.

However, an important aspect for Tully was how the water made her feel 'covered'. She said:

> *I am not the sort of person that likes to run around naked anyway...I think on reflection that helped…I felt secure…yes, I reckon that's part of why I liked it…I felt safe with the water around me…I sort of stayed in one position most of the time…just leaning forward*

Once again, women remarked on the depth of water that was important, and this was yet another intertwined theme. Claire remarked how the water level in the pool at the beginning of her labour had started off lower, and when she first entered the water she remembered:

> *It didn't quite cover my body…and then they filled it up higher and it was covering my breasts when I was upright and that felt better…the depth.*

It appeared that the 'cover' provided by the water, made these women feel safer and less vulnerable or exposed. In addition, the positions these women adopted during labour and described by them in their stories as helpful, allowed them to be deeply immersed in the water. They had the ability, when deeply immersed, to float, or lie on their stomachs. These examples were commonly mentioned in the stories.

Molly's story remarked on how she instinctively positioned herself so she was floating on her stomach. This position also helped her remain focused and helped her remain covered because as she reflected: *In the water I could just be, sprawled out and floating.*

This is yet another example of women, without conscious thought, adopting a position during labour that reduced their 'visual' stimulation. Feeling '*invisible'* was also mentioned in their stories. It appeared that the sides of the pool provided a barrier so that they could not see activity around them, others could not see them, and, in addition, the positions they adopted also reduced visual stimulation. Ellie described how being immersed in the water apart from covering her also helped her tune into what her body was telling her. She remembered that most of her time in the pool was spent kneeling down.

To Ellie, being immersed in the warm water was like: *Having something [coverings] around you…*She described this as emotional as well as physical support which allowed her to: *Move in any position [although] I didn't change positions that much…I knelt down most of the time*.

Sprawling, stretching, floating and kneeling, were repeated in many of the women's stories, an affirmation that these were important enough for the women to mention them more than once. Immersed in the water they reflected:

I was able to float on my stomach in the water. (Rosa)

I could actually stretch out and float on my stomach. (Claire)

I could be squatting, kneeling, leaning forward, or whatever. (Daisy)

Immersed in the pool the women told of instinctively feeling safe and invulnerable, able to tune into what felt right for them. Daisy described a time when she was not in the pool. She remarked that it felt like being in the open and this left her feeling exposed as though she was:

> *Standing in the middle of a desert compared to standing in a forest. Like it had a really different presence [which] you can really feel. …whereas in a closed space you can feel safer…you can feel no one staring at you.*

This left her feeling strong and safe so that she could 'open up' to the experience of birth. Labour is a time of vulnerability with women describing how wide open they felt. To overcome this required encouragement and trust in what they were doing underscores the need to have complete faith in themselves and their caregiver. Daisy also described her labour and birth as a time of 'openness', saying: *Like in terms of giving birth, [that] my body has just been opened up.*

Molly's story highlighted the fact that the water helped her to 'open up' while giving birth. She surmised that feeling safe and not exposed was due to the depth of water in the pool

and her midwife. She could be '*immersed'*, and was not left feeling naked. She said that when she had laboured in her 'normal' bath, the water level:

> *Didn't cover me up, I still felt only partly covered as the bath wasn't a big one…but in the birth pool I was covered… I think this helped as the water helped me sort of dilate and open up.*

For some of the women, labouring in water was a time in which they were able to rise above 'one's self', to surpass their natural, normal abilities. Daisy described how she was able to 'claim' her baby at birth and clasp her to her chest. She was not 'delivered of' her baby but was able to 'give birth'. She related her experience of this moment saying:

> *I was just making eye contact with her while she was in the water, just going, oh my god, this is like the thing of looking into me and looking into her...and oh, my god I am actually going to receive my own baby, and although my midwife was standing right beside me, I sort of felt like she knew that as well...and knowing that she would not lean over and grab her...and while I was waiting for the next contraction I was mildly freaking out about how excited I was that I was actually going to get her myself and how incredibly defining that was in our relationship, for me to just go, right now, you are my baby...to take her and bring her into the world...that is so major !!*

The experience of deep-water immersion during childbirth allowed these women to view even the intense parts of labour positively so that they were able to say: *I could do that again!* Daisy reflected on why she chose to use a birth pool again in her next pregnancy. She stated that being immersed in the pool was not a problem for her as she could not be seen but possibly:

> *For other people that were there [at her birth] in terms of their vision of what was happening…whether they could see what was going on.*

Although Daisy laughed, saying that she had not asked them about that as yet, but wondered if their not being able to see clearly had made it more exciting for them. However, Daisy chose to use the birth pool was because she: *Could not be seen.*

There was peace, and privacy and normality, these births being described as a: *family thing*. The preceding stories have reflected how the experience of deep-water immersion helped these six women feel supported and nurtured during childbirth. They were visible yet felt invisible to onlookers protecting modesty and preventing feeling of self-consciousness.

Deep-water immersion was described in these stories as a safe quiet space to be. It allowed these women to sink into the rhythm of labour, their bodies becoming graceful and instinctive. The water provided a place where women could go 'to', a place where they could unconsciously rest naked, unconstrained, and free.

The water was warm and deep and covered up their bodies. The water also supported the women's partners and in one case, supported a sibling as well.

The preceding stories have described the birth pool as a place in which to feel supported, natural and uninhibited during childbirth and provide a common thread winding through all the women's stories. The next chapter will interpret and discuss the themes arising from the women's stories in line with Hermeneutic Phenomenology. These themes will be discussed by utilising Van Manen's (1990, p.101) "Life-world Existentials" as the framework for analysis, in order to reveal the essence the phenomenon of deep-water immersion during childbirth.

The following chapter will discuss in greater depth, each of these themes to make of them a 'whole' in order to discover the essence of the phenomenon of deep-water immersion during childbirth.

CHAPTER FIVE: DISCUSSION

The stories presented in the previous chapter describe the women's lived-experiences of deep-water immersion during labour. From these lived-experiences, I have sought to capture the essence of this phenomenon, interpreting the women's stories using the four themes, arising from the data. To sum up, this chapter brings together the women's descriptions and interpretations, the essential elements of each woman's story, with the aim being to unite them as a whole.

To achieve this aim, as previously stated, these themes will be discussed by applying Van Manen's (1990, p.101) "Life-world Existentials" as the framework for analysis. Each one of the themes identified, ***The Shape of Water; Warping Time; Water's Embrace and Naked but Clothed***, relates to one of the four life-world existentials and thus provides a way to access the essence of the phenomenon of water immersion during labour. So began my search for the key to why deep immersion in water during childbirth worked so positively. I had seen it with my own eyes yet I needed to ask these women what was it that I had seen and heard.

Minichiello (1999) suggests that few people will expose to a stranger their inner thoughts at first interview. My background as an independent midwife, familiar with the use of deep-water immersion during childbirth, proved valuable when the interviews occurred, as possessing an understanding of the phenomenon to be investigated, it has been said, encourages the development of trust (Minichiello, 1999). I strove to listen and validate the women's stories of their experience during each interview and to fulfill the ethical obligations of a researcher (Geanellos, 2002).

Van Manen (1990) states that the story (narrative) approach has two major purposes, namely to "be used as a means for exploring and gathering experiential narrative material" and, to "develop a conversational relation with a partner about the meaning of an experience" (p.68). Understanding forms part of practice knowledge, hence reinforcing a positive relationship between midwife and client (Geanellos, 2002).

As discussed previously, feminist principles underpin midwifery practice (Guilliland & Pairman, 1995) and women's experiences are regarded worthy of study. This study was conceived to understand the way in which these women experienced the use of water immersion during their labour and birth in order to make this option available to all women. This researcher shares the belief that women's experiences do matter and thus contribute to existing practice knowledge.

During the analysis phase of this study I tried to read the stories as a stranger might, continually writing and re-writing to produce a text that could be interpreted, at first a

difficult task. Van Manen concurs that this is often hard as our intimate knowledge of the intentions expected from the study "may load the words" however, constantly writing and re-writing "seeks to make external what somehow is internal" (1990, p.127). This process did not however elucidate the meaning of water immersion at this point. I was yet to discover the phenomenological structures, those that authenticated the women's experiences.

Van Manen (1990) suggests that there is a difference between "our pre-reflective lived understanding of the meaning of [the phenomenon] and our reflective grasp of [its] phenomenological structure" (p.77). This entails reflecting the women's stories appropriately and making clear the structure and meaning that these women gave to the lived-experience of water immersion during childbirth (Van Manen, 1990).

THE LIFE WORLD REVEALED

The 'lived-experience' of a midwife researcher, is intensely personal, being *contained* within as well as *constrained* by the experiences of life where each part is considered in relationship to the whole. As midwifery is a profession that "does not provide care to women, [but] provides care with women" (Kennedy, 1995), p.410), the approach suggested by Van Manen (1990) is suitable for this study as it places the woman in the context of her lifeworld.

This contextual life approach within a feminist framework seemed most appropriate when studying women's lived-experiences. In turn, hermeneutic phenomenologic reflection acknowledges and values meanings human beings ascribe to experience. It is not just another data collection method but a way to bring language to human experience (Flew et al., 1979; Holloway & Wheeler, 1996; Kennedy, 1995), and a way to uncover truth through interpretation. The results of hermeneutic phenomenological inquiry and reflection provide a 'life world' account upon which we can respond 'so that is what it is like', the understanding and perception of the phenomenon. Thus through interpretation and reflection on each woman's lived-experience we gain knowledge (Leonard, 1994) which leads to understanding (Van Manen, 1990). Truth and knowledge are discovered by engaging in the process of interpretation that is the 'hermeneutic circle' (Ezzy, 2002).

The women's stories encompassed the four existentials of 'space', 'time', 'body' and 'relation' in a way that reflected their lived-experience (Van Manen, 1990). Pondering these four existentials reminded me that although there were themes occurring as I read and intuited each story, these themes were also part of a much bigger picture. These existential themes may be "differentiated", but they cannot be separated. Van Manen (1990) suggests that "they all form an intricate unity which we call the lifeworld" where one

existential theme always call forth the other (p.105). This blending of themes added to the challenge and complexity of the analysis as each story contained and revealed all four aspects of the life-world existentials whilst also emphasising individual aspects.

Lived Space (Spatiality):

The ***Shape of Water*** illustrates the theme that space is something humans can feel and which imparts a profound influence upon our lives, even if space is not something often thought much about (Van Manen, 1990). The pool, as a space in which to labour, had an atmospheric and special quality and this facilitated relaxation by providing these women with a private, protected and warm environment that also supported the women's bodies. The pool, and the water it contained, provided a space where women could go 'to' in order to 'let go' and allow labour to transport them from woman to mother, from painful contractions to contractions, which were described as manageable. From the quantitative data used in part one of this study, it emerged that women who laboured and gave birth in the water did not feel the need for, or require analgesic pain relief. This is not to say that these women had 'pain free' labours', but labour pain was experienced as manageable.

Although the women described a sense of satisfaction with their ability to cope with labour pain without the need for drugs, water was not a magic formula for eliminating pain. Immersion in water appeared to change the way contractions were experienced, it changed labour's 'shape'. The warmth of the water and the tactile stimulation this provided, created a background of pleasurable sensations on the labouring women's skin. Painful contractions were superimposed on this background, having to 'compete' for access to the brain and spinal cord, which partially 'gated out' this childbirth pain (Balaskas & Gordon, 1991, pg. 33). During labour the women would often enter and leave the pool at different times, thus providing an opportunity for them to reflect, and compare the quality of pain both in and out of the water.

The physical surrounds of the pool, including the walls and the frame, were also important elements in the stories. These provided privacy and strength, parts of the pool that have not been previously questioned or mentioned in the literature.

Rosa, Molly, Tully and Claire all made mention of the pool frame, and walls being an important part of their lived-experience of water immersion during childbirth as the frame gave physical support to them and their partners. The pool defined these women's personal space giving them room to move, in addition to containing the space they laboured in. They were shielded from the outside world not only by the water, but by the walls of the pool as well. I have interpreted this description of the illusion of walls to be similar to the walls of our homes, a deterrent to intruders. This barrier discouraged

interventions (Balaskas & Gordon, 1991) and protected women from feeling vulnerable, and in addition, provided a private space in which to labour whilst naked, without feeling exposed.

The frame also offered a physical strength, the *'Jesus bar'* as Claire described it. The bar or frame around the pool grounded women, who all knew it would support their weight and the weight of their partners as well, providing a solid anchor in a sea of fluidity. This is similar to the physical support encouraged in many cultures during childbirth, and may include the use of a bar, rope or hanging support from another woman or man. An early midwifery book written in the 18th century, suggests that it was common for Scottish women to stand with their arms around another woman's neck for support during labour (Kitzinger, 2000b). The use of this type of physical and emotional supportive strength has been re-discovered and is now commonly used in birth rooms in particular when the maternity care being provided is 'woman-centred' in outlook. This is most commonly experienced when midwifery care is provided one to one, a partnership between mother and midwife, a model of care promoted as being a significant factor in low intervention rates and lower relative costs for birth (Tracy, 2002).

However, the most common themes that arose out of the data at this stage were the women's descriptions of feeling safe and private when immersed in the pool. The water proved crucial in allowing these women to remain in control of their space, and was a necessary component of feeling physically safe. Birth is an intimate time in a woman's life, a time where feelings of personal safety make a positive impact upon birth (Odent, 2001). Conversely, if women do not feel safe or in control physiological childbirth becomes more difficult and intervention rates then increase. This in turn leads to increased costs to the health care system and is thought to affect the quality of a women's birth experience (Tracy, 2002).

As social beings we often take our own space for granted, as space is thought to be a fundamental of the life-world, remaining unspoken because humans fail to recognise this tacit knowledge (Leonard, 1994). As I reflect on the women's stories, I wonder whether water immersion helps challenge this taken-for-granted-ness? To dismiss the importance of a safe and personal space as merely subjective is a failure to comprehend that this is a true description of the real world (Fjelland & Gjengedal, 1994). Odent (2001) endorses this belief whilst also suggesting that it is in fact detrimental to labour if a woman does not feel safe, as this will stimulate her brain and she will inhibit the hormones that promote physiological birth. Understanding how important the theme of shape or space is to physiological birth provides midwives with an imperative to ensure that a woman's personal space is protected during childbirth, wherever they may give birth.

All six women reflected this fundamental theme, however it was but one piece of the puzzle I had been seeking. In the women's words, deep-water immersion helped them feel safe, but it also provided so much more:

> *I couldn't have done it without water, if there was no water involved in the labour, I think I would have lost the plot really early on, and I think, in my mind, I would have, I think I would have gone crazy. (Molly)*

> *I don't know how I would have been able to do it without the water…a few women have asked me, was it good in the water, and I said yes, it was fantastic, really fantastic. (Rosa)*

> *I don't think I could have done it without the water, now that I have had water. I have been thinking about my friends who have had babies without water…there is no way I want to have a labour without a pool, I feel it is an integral part of labour now. (Claire)*

> *To me all I was looking forward to was birthing in the water, and, I knew that I was excited by the prospect of getting back in there and being in that pool and doing it again. (Daisy)*

> *I can't imagine another labour without using water. (Ellie)*

> *Birth is hard work but I can't relate to not having the pool, like I just wouldn't change it, I was really happy. (Tully)*

The pool and the water provided a tangible space and became integral in facilitating these women's positive birth experiences. Spatiality is felt space, a difficult concept to grasp as space is something not often thought about and yet it affects the way we act and feel. Van Manen (1990) has suggested that the nature of space is pre-verbal, not something we put much thought into and therefore, difficult to put into words. As Claire's story illustrates, even though she had described the pool as a square, when she reflected back on this description she appeared puzzled and described this recollection as *interesting* and a possible example of a sub-conscious memory, not a readily conscious thought. Each woman had difficulty when asked specifically about the space in which they laboured, yet they each knew instinctively what was right for them.

Space may be a spiritual experience, or engender feelings of being lost and alone, vulnerable or safe. This is particularly important for women in labour who need to feel safe to allow their bodies to act instinctively and give birth. In emotional and physical terms, this means that reducing stress hormones will promote production and secretion of other hormones that help physiological labour and birth. The 'space' women laboured in affected the way they felt, supporting Van Manen's (1990) suggestion that we 'become' the space we are in (p.102).

For the six women, the shape of water was a constant in their labour. Although this has been expressed in different ways throughout their stories, the sense of personal space, remaining in control and more importantly, feeling safe, remained central. The shape of water was expressed in the stories as a personal space, created and controlled by the women. Feeling in control as well as maintaining control during labour is an important part of maternal confidence and has been shown to facilitate a positive childbirth experience (Hall & Holloway, 1998; Morison, Hauck, Percival, & McMurray, 1998; Parratt, 2000).

Analysing these stories, I have conjectured that immersion in water provided women with a safe, personal space in which to maintain control of their environment in order to 'let go'. The water was also relaxing, physically and emotionally, thus allowing the women to act instinctively. In effect, the pool allowed these women to maintain 'control' and 'disconnect' the outside world or helped them 'focus on the contractions' because of the space they were in. As I have attended women who have used deep water immersion during childbirth, I have witnessed this happen as women were able to instinctively turn off outside distractions and allow themselves to become immersed in the process of childbirth, to surrender to the moment. This was true for the women in this study.

Birth as a process is an intimate act akin to making love; a private production not performed as a public event. During lovemaking and at the time of birth, high levels of ß-endorphin are released especially if women feel relaxed and safe. These opiates are both the hormones of pleasure and natural pain killers, the body's 'reward' for doing something which benefits the survival of the species and are secreted by all mammals to protect themselves during the birth process (Odent, 2001).

The birth pool provided an atmospheric space which these women could go to in labour, a space which was safe and home-like and provided 'comfort memories', as home in these stories was viewed as a 'safe' place to be.

Tully described this as security and safety because, as she explained: *[I was] Not as vulnerable because I was enclosed within the pool walls.*

Rosa experienced the pool as a contained space which was *dark, midnight dark* which I have interpreted as the pool providing a place where there were no distractions to 'switch on' her neocortex, thereby reducing her stress levels. Being in darkness provided her with privacy and this allowed her to instinctively tune into her body and permit labour to progress. This was another common feeling described by the other women, who also mentioned that the pool removed both visual and auditory stimulation so that there were no distractions to interrupt or disturb their labour.

It appears that space is interpreted, and intuited, by each woman in an unconscious manner. This personal interpretation of 'space' is described and illustrated by Rosa, Claire and Daisy's stories, a space can be wide open and still feel safe, or alternatively, for others the space needs to feel small and contained to engender a feeling of safety. It is apparent from these stories that the size of the labour space is not all that is required for women to feel 'safe' during childbirth, they also needed to maintain control both physically and emotionally.

In analysing these stories, I have come to understand the impact that space imparts on the experience of labour. Understanding this significance helps me as a midwife to understand and interpret why and how each individual woman experiences and maintains control of the birth process. This has application in midwifery practice, as protecting a woman's physical and emotional space is a simple measure which can be undertaken during labour to help women feel safe wherever they may be giving birth. When women are unable to exercise control over their environment, their health tends to suffer (Odent, 2001), but being in a position to take the initiative and remain in control is life enhancing (Van Manen, 1990).

This is somewhat of a paradox as being in control was necessary for women to feel safe, because feeling safe then enabled the women to relinquish control, thereby ensuring that labour and birth would occur safely and uneventfully. Although these stories describe the importance of personal safety and control in different ways, the effect of maintaining personal space remains central to the understanding of the benefits of deep-water immersion during childbirth.

Lived Time (Temporality):

Water seemed to give women the ability to ***warp time*** during their labour, which elicited the sub-theme of transition, where labour was seen as a way to move forward into motherhood as well as leaving the pregnant woman behind. Immersed in the water there was no need to hurry or for these women to do anything else except '*be*', wherever or whatever '*be'* might have been for each of them.

There appeared to be a strong, unconscious attraction felt by the women to enter the birth pool. There they were able to reach a level of consciousness that appeared to help them tune into their instinctive brain (Korte & Scaer, 1992; Odent, 2001). Deep-water immersion allowed women to withdraw into themselves as labour, and the contractions, became stronger promoting, beneficial hormone release (Balaskas & Gordon 1991). Birth, like orgasm, alters the level of consciousness by decreasing the action of the neocortex thereby increasing the secretion of ß-endorphin. This affects how time is

experienced and remembered. To reiterate, ß-endorphins are opiate like hormones, their narcotic affect alters perception of pain by altering the 'thinking' part of the brain (Odent, 2001) and thus in addition to affecting the experience of time, promotes physiological labour and birth.

Women immersed in the pool did not feel rushed to set up the space they were labouring in, or to get the pillows arranged for the next contraction, nor have to worry about how long labour might take. In addition, these women did not feel subjected to a time limit within which to give birth, they were able to luxuriate in the moment, to delight in the expectation of what was to come, as time was also 'anticipation'. The length of labour may be likened to a meal, one that can be savoured, not rushed. This was illustrated in these women's stories as something to look forward to, the future was beckoning them to come and join in. This motion between the time now and the time to come was yet another paradox of deep-water immersion.

Reflecting on this paradox raises the question, what is a 'normal' length of time for a labour and why is this so? Modern obstetric practices claim to have 'saved' many women from prolonged labour defined in the 1950s and considered prolonged when it exceeded 24 hours. Nowadays the generally expected limit is 12 hours, the rationale being that the longer the labour the greater risk to both mother and baby (O'Brien, 1997). However, if the length of normal labour is viewed too narrowly, more labours will be defined as prolonged thus leading to possibly unnecessary intervention (McNabb, 1997; O'Brien, 1997).

Part one of this study showed that women who had access to deep-water immersion had an average labour length of ten hours, a finding which is supported by Otigbah et al's study (2000) which concluded that for primiparous women, the total length of labour was reduced by ninety minutes in the water-birth group.

This is further supported by these women's experience of labour. Each woman commented on how she believed being immersed in the water in fact shortened the length of labour although each woman had no clear recollection of how long they had expected labour to last. They had no preconceived idea of the time as they 'just laboured'. Rosa wondered about how long her labour would last but, as she explained, *not with a sense of anything frantic*. Daisy considered that the reason her labour appeared to be short was because of her ability to *just prop* in the water and not worry about how long things would take. Each woman possessed an intuitive, instinctive trust that being in the water would be safe and not detrimental to childbirth outcomes as illustrated in part one of this study.

As evident from the stories, there were times during labour when the women needed to lose contact, to find somewhere private in order to reduce the degree of stimulation occurring during labour. The water provided a medium for the women to transport themselves to another place where time could be manipulated in individual ways, which would place them in the best possible position for birth to occur. This was like the birth of a new awareness of their world. Odent describes how women who are left undisturbed in labour are able to travel to or go to a place in their mind that is "another planet" (2001, p.89). He suggests this is most apparent when women are able to be in a physical position, for example kneeling on all fours, which reduces the activity of the neocortex or the 'thinking' part of the brain (Odent, 2001), and is a human protection mechanism.

In this study, the pool helped women reduce sensory stimulation by softening external noise, allowing them to choose positions that reduced stimulation of the thinking brain, thus reducing adrenaline secretion whilst promoting ß-endorphin release. In addition, combined with low light levels in the pool and surrounding area, which also promote relaxation and reduce stress and hence adrenaline production, the women were unaware of time, and day and night had no meaning. As Rosa described in her story, being in the pool was, *dark, midnight dark*. Rosa experienced this as a positive effect of being in the pool because it helped her remain focused and able to turn inwards, testimony to the fact that reducing bright lights during childbirth has a beneficial effect on the labouring woman. This is congruent with the ideas proposed by Odent (2001).

Labour was revealed in the women's stories as, a 'place in time' that was neither in this world, nor apart. It had a time-less-ness to it, experienced by these women as both a passing into, as well as a passing through, and marked the transition from pregnancy to motherhood. Transition time was also capable of being manipulated and it appeared from the stories that this was both a journey and an end-point in each woman's pregnancy, labour, and birth.

All six women recognised this travel was like different forms of arrival, just enough for them to cope with and just enough for their babies to cope with as well. Time became a form of travel to and from childbirth and into a new relationship. Birth did not end with the cutting of the umbilical cord, it was a continuous process which flowed from clasping their baby to their chest, and the maternal bond that was then formed between mother and baby. This is consistent with Van Manen's view regarding the lived time experiences of special days and significant events, which he describes as the "modality of hope" (p.105). Childbirth is one such time when women are able to experience hope and anticipation as they start on the journey of motherhood and begin to look beyond the present moment.

The theme of ***Warping Time*** presents a challenge for midwives who are "programmed" to work with 'clock' time. The women who used water immersion during labour did not need to watch the clock because they were able to surrender 'to' and luxuriate 'in' the moment without rush. The lack of a 'hurry-up' factor was described in the stories as not having to get the pillows organised or setting up a place ready for the next contraction, thus allowing women to 'savour' childbirth. None of the women had any real idea of time in a structured sense, as time was ethereal and able to be manipulated. As the stories illustrated, water immersion distorted or suspended time, the experience slowing down or speeding up depending upon what the women instinctively needed. The water affected how women felt about time, they were able to luxuriate in or transcend the moment as desired.

Warped time was also anticipation, something these women had been looking forward to. They were anxious to get into the pool because for now it was an end-point, an achievable goal because it meant they were in established labour. They were anticipating it would be challenging, however it was something they were excited about doing. I intuited this goal of needing to be in the pool as the women's personal validation that at the end of all this hard work they would give birth to their baby, the reality of being 'in' labour. Van Manen (1990) suggests that this anticipatory aspect of time is our temporal way of being *in* the world. This is a time of transition, a passing through time to becoming a mother, and constitutes the past, present, and the future.

Some women had heard that water would slow things down but in reality, this was not their experience. In fact, water immersion led in some cases quite quickly to a spontaneous birth. These six women were able to be *in* their labour without having the added worry about 'producing a baby' within a set time frame. In fact, removing this element from their labour helped the women by allowing them to labour at their own pace. Conversely, this affected labour's length by facilitating a shorter labour because this hurdle was removed.

The women also described being able to transport themselves to another place during labour. Rosa called it '*labourland',* Daisy described it, '*an unexplainable sort of feeling* 'where she was, '*spiritually removed from what was happening'* and *'then the real world started to come in'.* She wondered where time had gone and said: *I can imagine it a bit like death and life continued…the water kind of changed reality'.* Ellie felt like she was: '*floating above the situation* and then: *realised what was going on around* [her]*, the sound of the builders working down the road'.*

These stories formed a connection between what was remembered and what was left out. Time was in effect, warped. Warping time was also a path to 'another planet' and was a

wonderful demonstration of how the endogenous hormones are important players in normal/physiological birth. Maybe the opiate quality of ß-endorphin enabled these six women to travel to wherever they needed, or wanted, to be. The theme of 'warping time' epitomises how these women's creative ability allowed them to surrender to the moment, regardless of how long that moment might be.

This theme represents a major challenge for midwives who practise on linear time and may create problems for women who 'fail' to meet set criteria regarding the length of time they are allowed to be in labour. This brings to light the issue of power and control of the birth process and how this is managed. Is it power over women in labour or power 'with' them? As discussed previously, when midwives are able to provide one on one maternity care that includes women as partners in any decision-making, women experience childbirth as satisfying. In addition, this non-pharmacological model of care has been demonstrated by Tracy (2002) to reduce the overall cost of maternity care.

Negotiating the 'temporal landscape' entails understanding that time is a mixture of past, present and future (Van Manen, 1990). In the stories the women told me, labour had a rhythm and flow about it that was not programmed to be anything but what they needed it to be. This was summed up by Daisy who described how she did not need to set up for the contractions: '*and timing, just feeling that time is such a strong factor, that I didn't have to worry about the time, hurry up, get the pillows over there, or whatever. Everything was just there in a way, because the water provided half of it'*.

However, the ability to warp time was also just another piece of the puzzle of water immersion. How the women experienced themselves in relation to the 'other' also needed consideration.

Sharing Lived Relation (Relationality):

The theme of ***Water's Embrace*** illustrates the physical connection between the water in the pool and the labouring woman. To recap, the water gave physical support to the whole body and was more profound in those women who described themselves in the stories as 'heavy' on land. The water appeared to lighten the load both physically and emotionally. Water's embrace also incorporated the sub-theme of ***support***. This included support of the woman, her partner, and in one story, a sibling as well.

When reflecting on their experiences, all six women remarked on how easily they could change positions in the water and this was especially helpful for women who had sore knees or hips. Immersed in the water, they could adopt active birth positions which these women recalled had been impossible to adopt on land because the water supported their

body and made changing positions effortless. This is consistent with the effect of buoyancy.

Archimedes, a 3rd century mathematician discovered the physical law of buoyancy known to us as Archimedes Principle. He theorised that any body, completely or partially submerged, in a fluid at rest, is acted upon by an upward or buoyant force. The magnitude of this force is equal to the weight of the volume of fluid displaced by the body, when totally or partially submerged (Balaskas & Gordon, 1990). Therefore, the upward force of buoyancy supports a mother immersed in water during labour, relative to her weight. Immersion in a deep pool of water results in a feeling of 'virtual' weightlessness, enabling ease of movement by reducing the effects of gravity (Balaskas & Gordon, 1990, 1991; Bertram, 2000; Lichy & Herzberg, 1993; Nikodem, 2000). In addition, buoyancy promotes more efficient contractions, better maternal blood circulation which leads to increased oxygen to baby and to the uterine muscles and hence lessens maternal pain (Balaskas & Gordon, 1990).

All women emphasised the relationship between being immersed in '*the water*' and the ability to move and adopt positions of choice during labour. Some of the positions the women described would be an uncommon sight in a traditional labour room. For example, these women were able to float on their stomachs!

This suggests that water immersion was more, much more than just a highly effective method of controlling childbirth pain, the support provided by immersion in water had a presence about it that was ethereal and hard to pin down. In addition to general physical support, the women felt this also included support of their perineum. The water helped with the acute burning sensation associated with birth of the baby's head. At the time of birth, the perineum must stretch to accommodate first the baby's head and then the shoulders and body. The water provided 'comfort' touch. Claire remarked of her surprise at the: '*small amount of perineal injury'* she sustained. Molly said she had heard: '*horrible'* stories from other women and had expected it to '*burn'* or '*hurt'* but: '*it may have been a bit sort of tingly, but it wasn't painful, it was bearable'*.

Water was mellifluous, and could adopt any shape, it embraced the women's bodies in many and varied ways, often unexpected. The water was both freedom from touch, as well as a grounding experience as the women remained in contact with the world. This is yet another paradox of water immersion. The pool provided both freedom of space in which to labour and yet was a contained space, defined by the pool walls.

In addition to the pool protecting the labouring woman's 'space', the water encircled the woman's body so that she did not need the physical touch of others. Yet emotionally, the

women found that the 'holding circle' provided by water immersion then enabled their partner and midwife to adopt a more supportive and a less 'hands on' role in her labour.

Immersed in the water, these women were able to soar; they could achieve things that they had not imagined were possible to achieve. The stories told of women's delight at being able to move so easily when they were immersed, and how the movement of water on their skin embraced them. The water not only helped women relax during labour, but the sensuous feeling of water on skin affected their experience of childbirth. These six women described how they experienced a lightness of both body and spirit, which was perceived as assisting them in tuning into their bodies more easily during labour. In some instances, the water absorbed other sounds so that this distraction was removed.

The warmth of the water as well as the depth, were important issues arising from the data. The efficiency of warm water to relax the women, to increase the electrical resistance of the skin and initiate the 'gate' receptors that reduced the level of pain experienced, as well as warming muscles in order for them to work more efficiently, was another part of the complex and varied effects of deep-water immersion (Bagness, 2000; Grabowska, 2000; E Hodnett, 2002; Mander, 1998; Moore, 1997; Paech, 1996; Plaat, 1998; Squire, 2000; Yerby, 2000). This affected the relationship between the women and the water.

The experience of labouring in water also provided women with a sense of purpose, a common ground from where they were able to relate to what other women had done before them. This in turn affected their relationship with their partners and children. Van Manen (1990) suggests that this relationship is highly personal and "charged with significance" allowing a fundamental sense of support and security which leads to confidence (p.106). This appears true for these women as they expressed in their stories feeling confident and safe during labour and birth.

Water immersion also provided support for the women's partners. The women were able to lean on them for physical support but not have to worry about being 'too heavy'. Water's ability to support women's weight gave them the extra strength they felt was necessary to give birth. When Rosa entered the water, she felt she had more energy because of the relaxing effect of water immersion and how this contributed to lightening the load. These women knew that childbirth would test their emotional and physical strength. Deep-water immersion was experienced as helpful because of the energising affect achieved by entering the pool, in addition to feeling lighter in the water. These women felt that the water helped them achieve this by removing the 'weight' of pregnancy both physically and emotionally. The women's relationship with their physical body was altered by being deeply immersed in the water.

Having another baby, who then becomes the focus of attention for parents and visitors, can be an alienating experience for a sibling who is accustomed to undivided attention. Every new baby creates a new family and preparing a sibling for another addition to the family was seen as a very positive aspect of using water for childbirth, as children were able to feel a part of the experience. Daisy had given birth to her first baby *Blossom*, in water and this daughter was invited to share her personal space, the pool. In her own way, Daisy was trying to ensure that Blossom did not feel left out or excluded from what she perceived as the '*family'* experience. She felt that having Blossom *'bumping around'* in the water while she was having contractions, allowed her to go back to the womb, a space Daisy felt Blossom would remember as nurturing and safe. In some cases women remarked that during labour, they were able to identify with their unborn child, and were transported back to their own watery beginnings, the womb.

The preceding stories captured the women's ability to identify with their unborn child, to float and be supported, to feel safe and nurtured, which was in a way a 're-birth'. Women felt they were able to return to the womb while in the water. Daisy identified with her baby about being in that *'watery space'* and *the 'sound' muffled like when you put your head under water*. The relationship with the water facilitated close mother to baby skin contact immediately after birth which has been suggested as beneficial in promoting early initiation of breast-feeding (Balaskas & Gordon, 1991).

These six stories captured women's thoughts of wonderment and curiosity about their relationship to this new person. Van Manen suggests this may be a surprise as we may have "already formed a physical impression of the person" and upon meeting them for the first time "that person looks very different from [what] we expected" (Van Manen, 1990, p.105).

Active birth as discussed earlier is a re-discovery of what women always did during labour and birth; they 'danced'. Freedom of movement during childbirth is in reality a return to our roots of women's birth knowledge, although this may be confronting to those who wish to control women's bodies at the time of birth. Midwives and doctors may recognise that movement in labour reduces the pain and stress that women feel during labour, but often 'letting' women have an active birth is a concession to placate their clients (Kitzinger, 2000a). Instinctive activity in labour not only relieves pain and [dis] stress but also helps the baby descend and rotate into the pelvis. In water, this instinctive tuning into the rhythms of childbirth facilitated women returning to a natural rhythm, they embraced childbirth as the water embraced them.

The warmth of the water facilitated perineal support, helped ease the pain of contractions and was also beneficial at the time of the baby's birth, the first breath being warm, moist air (Nikodem, 2000). Women were able to gaze into their newborns' eyes without the need for warm 'wraps', to look admiringly at their babies and examine them in detail, in all their naked glory as the baby was able to float supported in its mother's arms. In the water women held no fear that they would drop their babies, and being in an upright position in the water assisted in making eye-to-eye contact between mother and baby with the baby commonly held at breast level. As a baby's eyesight is keen at short distances (Sweet, 1997), this allowed the baby to 'see' its mother and use its sense of smell to get to know her, thus stimulating another hormonal surge which facilitated breast milk production and physiological third stage.

There are many reasons to suspect, says Odent (2001), that ß-endorphin and prolactin play a major role in attachment between mother and baby. Lactation also benefits survival of the species so it is not surprising that the same 'reward' system of ß-endorphin release is involved (Odent, 2001). Studies have shown that during breast-feeding, women have a peak in their ß-endorphin levels after twenty minutes (Odent, 2001). This rewards the baby, creating a kind of co-dependency due to the presence and transference of ß-endorphin in breast milk during feeding, thus proving that satisfied, 'drunk' look often associated with breast fed babies (Odent, 2001). Promoting skin to skin contact between mother and baby post birth has been recommended by many authors as a way to successful early breastfeeding with higher numbers of babies being breast fed at six months of age (Enkin et al., 2000). The growing body of evidence supports that not only do breast fed female babies have a lower rate of breast cancer themselves, but mothers who breast feed for six months have significantly reduced rates of breast cancer (Woodman, 2002). In addition, breast-fed babies are less likely to suffer childhood obesity, which has a strong link with adult obesity (Woodman, 2002).

This raises the question, was it the ability to be supported in warm water that promoted active, instinctive birth, or, was it the feeling imparted by water's movement across a woman's body? Certainly the women in this study identified these as important, but true also, was the perception that water shortened labour and improved perineal outcomes. The gentle birth of the baby and the ease in which mothers could have immediate skin-to-skin contact with their baby was another positive experience of using a birth pool. Because of the privacy provided by deep-water immersion, perhaps this engendered instinctive, intuitive behaviour in these women? The water appeared to affect her relationship with others. It lessened the distance between the woman and her baby and also influenced those around her.

Lived Body (Corporeality):

The theme ***Naked but Clothed*** alludes to the fact that whether humans consciously or unconsciously acknowledge it, we are always bodily in this world (Van Manen, 1990, p.104). The use of water during labour appeared to enhance relaxation with women becoming calmer and seemingly more relaxed (Odent, 2001) with less complaints of pain (Cluett, 1999; Morrin, 1997). The women's stories related during this study, commonly described feeling relaxed when they were immersed in the water. They felt 'covered' as they laboured so did not feel naked and vulnerable. This 'cover' of water over their skin, apart from reducing stress had the additional effect of reducing the pain of childbirth. The Gate Theory of pain control has been discussed earlier as a possible reason for women who had access to water immersion not requiring pharmacological pain relief during childbirth. Water 'clothed' the naked woman; it covered her skin with warmth and protected her so that the sensation of pain was diffused. Pain then became a 'pinprick', present but not overwhelming, as the balance between painful and non-painful stimuli reaching the neocortex was altered (Simkin et al., 2001; Telfer, 1997). These six women felt less pain immersed in the pool, as they were not feeling fearful or stressed. This finding is applicable to all labouring women, as not feeling stressed during labour closes the 'gate' thus decreasing the level of pain experienced. Labour pain has been discussed as a major concern expressed by women during pregnancy and childbirth. Read (1970) concluded that fear and stress during childbirth increased the level of pain experienced and his conclusion is supported by Odent (2001), Yerby (2000), Moore (1997) and others.

Water has been described by Odent (2001) as an effective way to "release the brakes" (p.97) as maternal stress was reduced, therefore reducing adrenaline production and consequently promoted ß-endorphin production. Odent (2001) states gratification is the body's reward for benefiting the continuation of the human species, with physiological birth the beginning of a hormonal "chain reaction" which starts with ß-endorphin secretion. This in turn promotes prolactin secretion, the mothering hormone, necessary for initiation of lactation, and which "put[s] the finishing touches" on maturation of the newborns lungs (Odent 2001; p.39). Although the women in this study did mention that labour was hard work, it was not described in their stories in a negative way. Their stories told of their emotional and physical strength during childbirth, in addition to feeling in control, giving personal meaning to their transition to motherhood. Lundgren and Dahlberg (1998) support this view concluding that the pain of labour and birth give women "strength and power", and this moves the woman closer to and into contact with her baby thus promoting maternal bonding (p109).

Combing the transcripts as suggested by Van Manen (1990), it became clearer that being immersed in water removed neocortical distractions and facilitated these women's labours. These positions were adopted by the women spontaneously and instinctively, yet these positions are known to impact positively on normal physiological labour and birth (Odent, 2001) because they remove extraneous visual stimulation. Once again, this appeared to be another piece of the puzzle of the effect of water immersion upon the experience of childbirth.

Naked but clothed, or the absence of vulnerability or exposure, was a major theme throughout the women's stories. These excerpts all illustrate the importance of a simple act, that of maintaining dignity at a time of immense physical and emotional change. Women described how they felt more vulnerable when out of the pool, or as Daisy described, she felt like she was *standing in the middle of a desert*. The water provided a 'cover' so these women were able to forget that they were naked and there was anyone watching as they laboured. In addition the birth room was often dimly lit, as semi-darkness is an effective way to switch off the Neocortex as does adopting leaning forward type positions or shutting one's eyes (Odent, 2001). The water was an illusion; it provided cover so that these women feeling exposed to the world did not disturb labour. In addition, these preceding stories tell of how feeling supported and cared for in a safe, quiet place facilitated their ability to turn inward and listen intuitively to their bodies.

Van Manen suggests that we always conceal something of ourselves whether consciously or unconsciously (1990, p.103). Feeling 'observed' especially when naked inhibits normal, physiological birth (Odent, 2001). It is ironic that other animals at the time of birth remove themselves to a place of privacy where they will not be observed. Yet women are required in most labour wards to have constant monitoring and observation in the belief by staff that they need to 'keep an eye' on what the labouring woman is doing. Odent (2001) suggests that like most mammals it is advantageous for the survival of the species if the mother feels safe during the birth process. If not, she will feel threatened and labour will not become established, or progress normally.

Van Manen (1990) also notes that the way in which we watch someone affects how they feel. When the body is scrutinised by a critical gaze, it may become awkward and unnatural (Van Manen, 1990). If the gaze is filled with love then the "erotic mode of being" is manifested in awe-inspiring love says Van Manen (1990, p.104).

The women's fascination with gazing into their newborns' eyes at the time of birth was illustrated in the stories. To quote Claire, Daisy and Rosa:

> *This was just her and me… To touch her for the first time, lift her up; bring her to me, and getting to know her shape, that was very, very special. (Claire)*

> *I watched her come to the surface and open her eyes… And there was this period of time where I was first looking into her face, where I just felt I was looking into her soul. It was incredible. (Daisy)*

> *What I remember is having him in front of me and wanting to love him and bring him close to me. (Rosa)*

The value these women placed on being able to have immediate contact with their babies immediately after birth, has been lovingly described in the above stories and is a profound example of the corporeality of birth. These descriptions demonstrate that being born into a peaceful, un-violated atmosphere helped these women bond with their babies and facilitated physiological third stage.

This gentle birth also benefited the baby who, welcomed in this way, gently and easily eliminates the stress hormones produced while being born, in addition to being instrumental in inducing another hormonal surge (Odent, 2001).

Being able to feel in control of their personal space in addition to feeling safe and protected facilitated the women's ability to act instinctively. Daisy described how she was able to feel supported by her midwife as well as feeling able to assert control and have her needs met, and respected. She tells of how she was able to 'get her baby herself':

> *I was mildly freaking out about how excited I was that I was actually going to get her myself and how incredibly defining that was in our relationship, for me to just go, right now, you are my baby…to take her and bring her into the world…that is so major!!*

This illustrates the importance of giving power back to the woman, as controversially, without women having babies, midwives would be out of a job. Women and midwives are often unaware of how much women may personally benefit from active participation in birth (Korte & Scaer, 1992).

Birth is women's business and therefore the needs of individuals must be respected. In truth, midwives have a duty to ensure that they act as advocates even if intimidated by the current "rituals and mysticism that are used to surround birth" (Barclay et al., 1989). Barclay et al (1998) conclude that midwives are responsible for ensuring women's business is respected.

The experience of using deep-water immersion during childbirth gave these women a chance to feel their own strength, whilst participating in the interviews provided them with an opportunity to tell their story, thus giving these women a 'voice' by re-living their experiences.

SUMMARY

Van Manen's (1990) guide to the four life-world existentials in combination with story telling has informed my method, enabling new understandings about the experience of water immersion. Each woman's story, unique in its own right, was also part of a whole story. Indeed, within each story there was a 'common ground' as each woman ascribed common meanings to the lived-experience or 'themes'.

The predominant theme arising from the data was that water provided a safe 'space' to be, and called forth the other existentials of 'time' 'body' and 'relation'.

The water provided women with a warm cover to wrap themselves in and helped them not to feel exposed or vulnerable. They felt 'safe'. Feeling safe led to relaxation, which in turn led to reduction of adrenaline. This probably promoted ß-endorphin release and secretion, which in turn provided women with opiate like, pain relieving hormones, thus enhancing their ability to manipulate or warp time. Not having to worry about how long or how short labour might be, nor having to set up the space for another contraction, gave women the ability to just exist in the moment. Time was also perceived as transition time, with women able to project themselves forward, to anticipate meeting their baby, or to transport themselves forward to their next birth experience or even to wonder how other women without access to water could be able to do it, childbirth. Time in this sense also brought forth the relationship between the water and its physical properties.

Water was warm, and soft, and a space to be invited into as well as a place to go to. Women encountered a relationship with the water, the experience of which was evident in their stories. Water was tangible, it made gloopy sounds, it ran or was poured on women's bodies, and was both a physical and pleasurable presence, which at times was unexpected. Van Manen (1990) discusses the surprise that can await us when we meet something that is known, for example, only in words. There was obvious delight when women told of how it felt when they first 'climbed' into the pool, and from personal experience the most common sound that women make at this time is 'Ahh'.

However, water was responsible for more than just the emotional and spiritual support as elucidated in the stories, in addition, water provided a potent physical support as well. It gave women freedom to adopt positions at will and to respond instinctively to their bodies revealing something about themselves that was not conscious or deliberate (Van Manen, 1990). Water immersion provided these woman with a private space in which to labour naked without feeling exposed with the walls of the pool providing a barrier which discouraged interventions (Balaskas & Gordon, 1991).

Being in the water removed distractions and facilitated labour so the women were in effect in the moment in spite of themselves, thus supporting the phenomenological fact that we are "always bodily in the world" (Van Manen, 1990). It also allowed them to transcend the 'heaviness' of their pregnant 'embodiment'.

All the stories described women's surprise at their ability to give birth as they had each acknowledged that labour was 'hard work' or 'really hard work' but then they countered this by also describing childbirth as 'easy'. Tully reflected on the tiredness she felt after the birth and how hard it was for her to leave the water behind and pass through into motherhood. *It was the getting out felt like hard, was really hard...but any movement after birth is hard...*Tully felt that this hard work was worth it and she would not change it.

This raises the possibility that it was probably the water which reduced stress and promoted relaxation that enabled women to labour without the need for drugs. The use of water during labour appeared to enhance relaxation, with the women becoming calmer and seemingly more relaxed.

However, this was not the answer I was searching for. My curiosity remained; what was the secret to the phenomenon of water immersion? There was not a straightforward answer for the meaning women attached to the lived-experience of deep-water immersion during childbirth. It was both multi dimensional and multi layered. Van Manen (1990) advises that identifying a phenomenon is "never [a] simple or one-dimensional" process (p.78). The tension between the physical and the spiritual effect of water immersion was like Yin and Yang, separate parts that fit together like the pieces of a puzzle. Overwhelmingly the stories recounted the thrill of being able to create the birth experience that was appropriate for each woman and her family. This is an example of feminism in action as the women were able to balance the scales of power, a time when childbirth became shared power with, not power over another, it was empowerment. The sharing of power and decision-making presents an obligation for midwives who must meet this challenge and ensure their practice is congruent with those of the woman and her family (Morison, Hauck, Percival, & McMurray, 1999).

The choice to use water immersion during childbirth was determined by each woman's need to maintain control during childbirth, which in turn provided her with the gift of relinquishing temporal control, in order to act instinctively. Control could also be identified in the women's descriptions of owning the space in which they laboured. In owning the pool, the women were uninhibited and their partners and others were visitors, their presence controlled by the women. Daisy related that because she felt secure and in control immersed in the water, she was then able to let go and relinquish control in order

to go 'in' to her labour. This was intuited as internal control and allowed the women to withdraw into themselves and thus work instinctively with their bodies.

This fits within the hermeneutic circle, which acknowledges that being human is a circular activity. We are "always in the world in a way that presupposes understanding" (Plager, 1994, p.72). By this, I propose that through being within the circle of life, human beings understand and interpret what we have experienced, because we have experienced, and thus have interpreted this as something, which brings us to new understandings.

It was interesting to note at first that it appeared the benefit of water immersion was its ability to provide a safe, secure place during childbirth, and this was pivotal to the women having a drug free labour and birth. There was also a strong suggestion emanating from the stories that this was only achievable if these women were able to remain in control of their physical and spiritual environment. It appeared that water had a curious part to play.

Many people can identify with the relaxation provided by a bath after a hard day and its almost mysterious effects on how we feel. Moreover, is this universal attraction to water an aspect of humans being 90% water, or, is it our beginning life in a watery womb? There are some scientists who believe that humans developed as Aquatic Apes (Odent, 2001, p.101). So is deep-water immersion perhaps a way to return to our watery past? Odent (2001) concludes that the Aquatic Ape theory helps us to understand why humans are so attracted to water, why they feel more secure in a "watery environment" in a variety of situations (Odent, 2001, p.103) and thus is applicable to childbirth. This idea of an inner watery environment was described by Rosa who felt it was like*; returning to the womb where your needs are all met, physical and emotional support during one of the most difficult and emotional experiences you will have in your life*. Daisy also described the water as: *back to the womb*. She identified with her baby in finding the water would be: *gentle, non-violent, and [a] quiet way to be born*. In addition, Daisy also felt that water immersion would be gentle for her older daughter Blossom as: *she loves being in the water*. Daisy wondered if this helped her at a time that was a challenging experience for her to be involved in, and made all the more special, as Blossom was the only person invited into the birth pool.

Midwives and maternity providers need to consider the effect of modern birth interventions, for as these stories have shown the simple use of water immersion is helpful for both mother and baby. For the mother, it is a method of relieving pain, promoting safety and freedom of movement, maintaining control as well as privacy. For the baby, it is a helpful transition from womb to world (Righard, 2001) and supported by Leboyer (1995) who recommended a warm bath for the baby after birth to ease stress.

In a very real way, the water integrated the four existentials of space, time, relation and body, which developed to suit each individual's unique childbirth experience.

To reiterate: *In the water there was a lack of hurry up time*; *It just made me more flexible, it took my weight; Not having to deal with my weight, in the water my body was not awkward but lithesome and supple*; *The water was a goal I was going to get to soon, a marker of progress, somewhere I knew I wanted to be*; *I felt secure with the water around me, I felt covered*; *In the water all the pressure was off* (Daisy, Claire, Rosa, Molly, Ellie & Tully).

The importance these women placed on the environment highlights how making the experience of childbirth as satisfying as possible for the woman and her family, enabling woman to feel in control, and 'own' her birth, needs to be recognised by midwives (Morison et al., 1999; Zander & Chamberlain, 1999).

As discussed previously, childbirth pain experienced in the context of coping (maintaining control), is fundamentally different to that experienced in the context of helplessness and was an important influence on whether women viewed childbirth positively or negatively (Caton et al., 2002; Lowe, 1996). Water immersion can ease the discomfort and pain of labour and childbirth without blotting out the experience.

The concept of creating a private, safe and supportive space in order to give birth is central to understanding how the women in this study encountered the phenomenon of water immersion. It was interesting to note that when the women referred to the physical environment, they were not concentrating on objects but instead highlighted the way in which the aesthetic elements were important to the experience of childbirth. These non-tangible features are potentially transferable to other groups of women in different birth settings to enhance their experience of childbirth (Morison et al., 1999).

This chapter has analysed the text as data to interpret the lived-experience of each woman. These six women were motivated to use water immersion during their labour believing this would provide a non-drug method of pain relief. However, they discovered that water was more, much more than this.

The following chapter will discuss the conclusion and recommendations which emerged from this study thus revealing the essence of deep-water immersion upon the outcomes and experience of giving birth.

CONCLUSION AND RECOMMENDATIONS

Revealing The Essence Of Water Immersion

> *There was a point where I had to get in the water I guess it was a particular point in my labour where I went, I have got to be in that space now!*
>
> **(Daisy 2002)**

In this study the experience of deep-water immersion is exemplified, by both excellent maternal and neonatal outcomes as described in part one, and in part two, by the waters' ability to facilitate normal physiological birth, the experience of which was viewed positively by all six women. As the women in these stories lived through childbirth, they reflected upon their 'lived-experience', which then became the basis for discovering the essence of the phenomenon of deep-water immersion, to make that knowledge visible within its context (Van Manen, 1990).

Water immersion was a puzzle, the separate pieces only becoming visible when the final piece was put into place thus enabling the whole picture to be revealed.

As I reflected, interpreted, and intuited the women's stories, as fitting with Hermeneutic Phenomenology, I was continually asking the question, what was waters' secret? What was it about the phenomenon of water immersion that made birth safe for both mother and baby, reduced the need for pharmacological pain relief, was family friendly but more importantly was described by these women as: *fantastic*, *a wonderful birth experience?*

These accounts of positive childbirth seem to be at odds with other women's experiences Satisfaction in birth is not a common occurrence nowadays as Brown and Lumley (1994) discovered, finding that 1:3 Australian women were dissatisfied with their experience of childbirth, regardless of length of labour or parity. As birth has become more 'managed' since then, it would reasonable to assume that this is still true. Indeed a recent systemic review of pain and women's satisfaction rates concluded that this influences women's experience (Ellen Hodnett, 2002). As Buckley (2002) remarked, women want a satisfying, life enhancing start to motherhood and family life. To understand what made these women experience childbirth so positively made me feel like Hermes.

Hermes was the mythological messenger used by Greek Gods to 'interpret and transmit' messages from heaven to humans in order for them to be understood (Flew et al., 1979). Like Hermes, midwives have experience interpreting meaning so that knowledge may be shared and truth discovered (Holloway & Wheeler, 1996; Rice & Ezzy, 1999).

This research has shown that water immersion facilitates a good birth experience, not pain free, but not painful, challenging but not overwhelming. Water assisted childbirth outcomes both physically and spiritually because the essence of the phenomenon of deep-water immersion was found to be, '***ESCAPE'***.

After a stressful day, some people may talk of 'escaping to the bath' possibly because of the almost mysterious way warm water relaxes us and affects the way we feel, both physically and emotionally. These labouring women were able to escape *FROM* as well as escape *TO*. Water immersion gave these labouring women both the means and the method to ESCAPE because they could manipulate the water making it whatever they wanted or needed it to be, the paradox of deep-water immersion.

The phenomenon of escape in these stories was also escape to, from one mode of being to another, the transition from pregnancy to becoming a mother. Escape was seen as a positive, these women escaped their old life to begin anew, giving birth to their baby, making a new family. Women could transcend inherent doubts about their ability to cope with labour, moving through the situation and coming out the other side saying ***I did this!*** They escaped to a renewed sense of their own power.

As these stories have clearly demonstrated, deep-water immersion provided these women with the opportunity to feel their own strength, to find their voice, and, to adopt any physical position they instinctively chose. The ease with which these women moved in the water allowed them to escape the physically pregnant body and become supple and light and engage in the 'dance' of birth. They rocked, they rolled, and they floated. The water provided the means for these women to escape gravity by enabling them to easily adopt and maintain upright and 'active birth' positions during labour. These positions promoted optimal pelvic diameters, which contributed to normal physiological labour and thus made birth easier for these women and their babies (Lichy & Herzberg, 1993; Morrin, 1997; Righard, 2001).

Johnson (1996), Morrin (1997) and Steer and Flint (1999) concur that the ability to move freely in an environment such as in a birth pool is of enormous significance to maternal satisfaction with childbirth. They claim that restricting women's movement during labour and position for birth is not effective, efficient or necessary and furthermore, increases the pain of labour (Johnson, 1996; Morrin, 1997; Steer & Flint, 1999).

The water enabled the six women in this study to feel in control both physically and emotionally as they escaped from fear and the perception of pain, and instead, escaped to birthing their baby 'under their own steam' whilst maintaining personal control.

Yet, in making choices about control, it was the ability to surrender control and let go, which helped promote physiological childbirth for these women (Parratt, 2000).

The need to escape childbirth pain by any means possible is perhaps the reason why women ask midwives for *something*, *anything* to relieve the pain even when they have attended childbirth preparation classes to learn strategies for coping with childbirth pain and have even requested a 'drug free' natural birth. This is powerfully illustrated by Claire's recollection of how if she had not had access to the birth pool, she would have wanted: *drugs, but in the water, I didn't need that, now that I have the water.*

This need to artificially escape may indicate a failure to be able to 'switch off' the neocortical mechanism that changes consciousness (Odent, 2001). However, the women who had access to a deep pool of water were able to 'escape' the pain of labour in many ways. They could escape to one end of the pool, they could remove themselves from the intensity of the situation by closing their eyes or they could transcend the moment and take themselves to 'another world' or 'into themselves'.

The women escaped from fear of the pain of the contractions, lack of control over their birth and their body, having a time-frame they were expected to keep, vulnerability, intervention and strangers. They escaped to a safe and intimate space they had created. In this private place, they had control of their birth and their body, they were surrounded by familiar faces and where safety of personal and spiritual space, autonomy, and security belonged to them.

The women could escape their perceived fear, as fear of the unknown is the trigger for humans to produce adrenaline, the 'fight' and 'flight' hormone responsible for removing us from potentially 'dangerous' situations (Odent, 2001). Because these women were able to reduce stimulation of the neocortex and promote ß-endorphin release, in some ways they were escaping on a 'natural' high. This may account for the glassed look women get in their eyes in active labour, or, how women are so into their own world they are unaware of the instinctive noises or movements they make during a labour where there is no 'interference', a finding supported by Pederson, Caldwell, Jirikowski, and Insel (1992) and Garland (2000). This study has found that these truths are evident in the women's stories.

In light of the findings by Lumley and Brown (1994), this raises serious questions about the ability of maternity services in Victoria to provide the care that women want. This has repercussions on women, families and communities as today's new mothers suffer unprecedented levels of intervention, anxiety and depression. These health issues are amongst the biggest burdens world wide according to the World Health Organization (World Health Organization, 2002). In addition, work by Tracy (2002) estimates that for

primiparous women who use non-pharmacological interventions such as continuity of midwifery care, the relative cost of birth is reduced by up to 50%.

Tracy (2002) identified that for Australian women, intervention rates are rising dramatically and these rates are noticeably higher for low risk women. In addition, they found that women are faced with fewer opportunities to access less interventionist models of midwifery care as maternity services are rationalized from midwifery orientated birth units to hospitals (Tracy, 2002).

The women's satisfaction with the experience of childbirth as shown in this study could help to address this issue. Influencing women's choices at a local level can ultimately create a groundswell for change and influence affairs at a policy level, thus, policies and protocols for the use of deep-water immersion can be set up using research to guide their implementation.

It is therefore the conclusion of this study that immersion in a deep pool of water during childbirth did not adversely affect either maternal or neonatal outcomes for the eighteen specified variables as discussed in part one of this study. Midwives can be confident to recommend deep water immersion as a safe, cost effective method of pain relief secure in the knowledge that the advice they give about this method of pain relief is "sound, practical and safe" (Alderice & Marchant, 1997).

In addition, part two of the study revealed that the use of water immersion during childbirth for these six women was an overwhelmingly positive experience. These women did not feel the need or require any other method of pain relief except deep-water immersion because they could escape.

Recommendations

In light of the findings, the following recommendations have emerged from this study; that further replication occurs using a longitudinal randomised controlled trial or retrospective chart audit with a larger sample. In addition, further study of women's experience of water immersion during childbirth should be conducted to establish sound clinical practice guidelines, protocols and to share research with peers and clients. This recommendation is supported by Otigbah et al. (2000) who concluded that there was no evidence to show that water-births were less safe for mother or babies than conventional births. They argue that labour and birth in water in fact conferred significant benefits to labouring women such as a reduction in the length of labour and perineal trauma and analgesic requirements for all women giving birth. They also conclude that water-births should not

be dismissed as unacceptable and furthermore, more research in particular, a multicentre randomised prospective study, should be undertaken.

It is recommended that the midwifery profession can foster women's control of the birth environment, ensuring that women's preferences and choices are honoured, although this may prove challenging as the 'comfort' levels of midwives are tested. If midwives were able to change the culture of birthing rooms to include viewing labour progress as individual, and not setting unrealistic goals of having a set rate of cervical dilatation, this lack of 'hurry up' would facilitate birth by allowing the hormones to do their job without interference. Midwives need to be encouraged to find their voice and ensure that they participate in evidence-based and woman centred care. From the preceding stories, it appears that deep-water immersion was an integral aspect of the experience of birth for these women. However, the resulting themes of ***naked but clothed, water's embrace, time space warp*** and ***the shape of water*** are not solely related to the use of deep water immersion, but are applicable to all forms of midwifery practice and should be implemented wherever women chose to give birth. Feeling safe, maintaining control, in addition to having realistic time limits set for labour, as well as the physical environment, impact on labour and birth, are part of 'universal' benefits for all women.

This study recommends that: deep baths in which women can squat, float and remain immersed, should be installed in all birth suites. In addition, this study recommends that midwives play an active role in policy making, that options of choice are disseminated to all women during pregnancy and labour, that deep-water immersion be made available not only to low risk women, as deep-water immersion confers significant benefits for women with hypertension or previous uterine scar.

This study endorses the use of water immersion for childbirth as an option that should be made available to all women and which should include labour as well as birth. Not to advocate deep-water immersion denies women access to a simple, safe, and cost effective therapy.

REFFERENCES

Alderice, F., & Marchant, S. (1997). Water in labour. In S. Moore (Ed.), *Understanding Pain and its Relief in Labour* (pp. 113-28). New York: Churchill Livingstone.

Althabe, F., Belizán, J. M., & Bergel, E. (2002). Episiotomy rates in primiparous women in Latin America: hospital based descriptive study. *BMJ, 324*, pp. 945-6.

Amir, L. (1998). Baby friendly hospital initiative: for happier mothers and babies. *Australian Family Physician, Vol 27*(5), 341-2.

Attwood, G., & Lewis, R. (1994). Pool Rules. *Nursing Times, Vol 90*(No 3), pp 72 - 3.

Austin, T., Bridges, N., & Markiewicz, M. (1997). Severe neonatal polycythaemia after third stage of labour underwater. *The Lancet*(350), p 1445.

Australian Nursing Council, Royal College of Nursing, & Australian Nursing Federation. (2002). *Code of Ethics for Nurses in Australia*. ACT.

Bagness, C. (2000). Relief of pain and discomfort in labour: a moral and legal perspective. In M. Yerby (Ed.), *Pain in Childbearing: Key issues in management* (pp. 75 - 91). London: Bailliere Tindall.

Balaskas, J. (1984). *Active Birth*. London: Unwin paperbacks.

Balaskas, J. (1989). *New Active Birth: A concise guide to natural labour*. London: Harper Collins.

Balaskas, J., & Gordon, Y. (1990). *Water Birth: The concise guide to using water during pregnancy birth and infancy*. London: Unwin Hyman Ltd.

Balaskas, J., & Gordon, Y. (1991). *Water Birth*. London: Unwin Hyman.

Baldwin, R., & Richardson, T. P. (1986). *Pregnant feelings: developing trust in birth*. Berkeley, California: Celestial Arts.

Barclay, L., Andre, C., & Glover, P. (1989). Women's business: The challenge of childbirth. *Birth*(5), pp. 122-33.

Barkway, P. (2001). Michael Crotty and nursing phenomenology: criticism or critique? *Nursing Inquiry, 8*(3), 191-5.

Beanland, C., Schneider, Z., LoBiondo-Wood, G., & Haber, J. (1999). *Nursing Research: Methods, Critical Appraisal and Utilisation. 1st Australian Ed*. Sydney: Mosby.

Becker, H. S. (1998). *Tricks of the trade: How to think about your research while you're doing it*. London: University of Chicago Press.

Beech, B. (1996). *Waterbirth Unplugged: proceedings of the First International Waterbirth Conference*, Books for Midwives Press, Hale, Cheshire.

Beech, B. L. (2000). Waterbirth-Time to move forward. *AIMS Journal, Vol. 12 No. 2*(9/4/2002).

Belenky, M. F., Clinchy, B. M., Goldberger, N. R., & Tarule, J. M. (1986). *Women's Ways of Knowing, The development of self, voice and mind*. New York: Basic Books, Inc.

Bertram, L. (2000). *Choosing Waterbirth: Reclaiming the sacred power of birth*. Charlottesville: Hampton Roads Publishing Company, Inc.

Black, M. E. (1999). A patient who changed my practice: The baby and the bathwater. *British Medical Journal, 319*(7217), 1114-5.

Bortin, S., Alzugary, M., Dowd, J., & Kalman, J. (1994). A feminist perspective on the study of home birth: application of a midwifery care framework. *Journal of Nurse Midwifery*(39), 142-9.

Brown, C. (1982). Therapeutic effects of bathing during labour. *Journal of Nurse-Midwifery, 27*(No. 1), 13-6.

Brown, L. (1998). The tide has turned: audit of water birth. *British Journal of Midwifery, 6*(4), 236-43.

Brownridge, P. (1995). The nature and consequences of childbirth pain. *European Journal of Obstetrics & Gynecology and Reproductive Biology, 59*(Suppl.), S9-S15.

Buckley, S. (2002). Healing birth, healing the earth. *Women Now, Winter 2002,* p5-8.

Burke, E., & Kilfoyle, A. (1995). A comparative study waterbirth and bedbirth. *Midwives' Chronicle*(January), p.3-7.

Burns, E., & Greenish, K. (1993). Pooling information. *Nursing Times, 89*, p.47-9.

Burns, E., & Kitzinger, S. (2000). *Midwifery Guidelines for Use of Water in Labour*. Oxford: Oxford Brookes University.
Byrne, M. M. (2001). Understanding life experiences through a phenomenological approach to research. *AORN journal, 73, April*(4), 830-2.
Cammu, H., Clasen, K., Van Wettere, L., & Derde, M.-P. (1994). 'To bathe or not to bathe' during the first stage of labour. *Acta Obstetricia et Gynecologica Scandinavica, 73*(1994), 468-72.
Campbell, J., & Bunting, S. (1991). Voices and paradigms: Perspectives on critical and feminist theory in nursing. *Advances in Nursing Science, 13*(3), 1-15.
Caton, D., Corry, M., Frigoletto, F. D., Hopkins, D., Lieberman, E., et al. (2002). The nature and management of labour pain: Executive summary. *American Journal of Obstetrics and Gynecology: Supplement to, Vol 186*(number 5), S1-S15.
Cefalo, R. C., & Hellegers, A. (1978). The effects of maternal hyperthermia on maternal and fetal cardiovascular and respiratory function. *American Journal of Obstetrics and Gynecology, 131*, 687-94.
Chalmers, B., & Porter, R. (2001). Assessing Effective Care in Normal Labour: The Bologna Score. *Birth, 28*(2), 79-83.
Chiarelli, P., & Cockburn, J. (2002). Promoting urinary continence in women after deliver: randomised controlled trial. *BMJ, 324*(25 May), 1241.
Cluett, E. (1999). Waterbirth study hoped to bring more choice and less pain to mothers in prolonged labour. *Journal of Advanced Nursing, Volume 29*(4), 778.
Cluett, E. R., Pickering, R. M., & Brooking, J. I. (2001). An investigation into the feasibility of comparing three management options (augmentation, conservative and water) for nulliparae with dystocia in the first stage of labour. *Midwifery, 17*, 35-43.
Coakes, S. J., & Steed, L. G. (1997). *SPSS Analysis Without Anguish*. Brisbane: John Wiley & Sons.
Cohen, J. (2000). A midwife's perspective: Labour and birth in the water. *MidwiferyToday.com, Summer*(54).
Cohen, M. Z., & Omery, A. (Eds.). (1994). *Critical Issues in Qualitative Research Methods*. California: SAGE publications, inc.
Collette-Paule, Z. (1997). Alaskan water births. *Alaskan Nurse, 47*(5).
Cronk, M., & Flint, C. (1989). *Community Midwifery: A Practical Guide*. Oxford: Heinemann Nursing.
Crotty, M. (1996). *Phenomenology and Nursing Research*. Melbourne: Churchill Livingston.
Crowther, C., Polit, D., Beck, C., & Hungler, B. (2001). *Essentials of nursing research: Methods, appraisal, and utilization*. Philadelphia: Lippincott.
Davis, E. (1997). *Heart & Hands: A midwife's guide to pregnancy & birth* (3rd ed.). Berkeley, California: Celestial Arts.
Davis-Floyd, R. E. (1992). *Birth as an American rite of passage*. Berkeley, California: University of California Press.
De Punzio, C., Neri, E., Metelli, P., Bianchi, M. S., Venticinque, M., et al. (1994). The relationship between maternal relaxation and plasma ß-endorphin levels during parturition. *Journal Psychosom. Obstet. Gynecol., 15*(1994), 205-10.
Dey, I. (1993). *Qualitative data analysis: A user-friendly guide for social scientists*. London: Routledge.
Doering, L. (1992). Power and Knowledge in Nursing: A feminist poststructuralist view. *Advances in Nursing Science, 14*(4), 24-33.
Drummond, J., & Rickwood, D. (1997). Childbirth confidence: validating the childbirth self-efficacy inventory (CBSEI) in an Australian sample. *Journal of Advanced Nursing, 26*(3), 613-22.
Eckert, K., Turnbull, D., & MacLennan, A. (2001). Immersion in Water in the First Stage of Labour: A Randomized Controlled Trial. *Birth, 28*(2), 84-93.
Ehrlich, K. (March 27, 4:13 2002). *Waterbirth*. Retrieved 9/4/02

Eldering, G., & Selke, K. (1999). Water Birth: A possible mode of delivery. In *Waterbirth in the 21st Century* (pp. 24-9). Ostend: The NPO Aquarius.
Enkin, M., Keirse, M., Neilson, J., Crowther, C., Duley, L., et al. (2000). *A guide to effective care in pregnancy and childbirth* (Third Edition ed.). Oxford: Oxford University Press.
Eriksson, M., Mattsson, L.-Å., & Ladfors, L. (1997). Early or late bath during the first stage of labour: a randomised study of 200 women. *Birth, 13*, 146-8.
Ezzy, D. (2002). *Qualitative analysis: practice and innovation*. NSW: Allen & Unwin.
Faivelson, S. (March 27, 4:13 2002). *Baths During Labor Reduce Pain, Don't Cause Infection*. Retrieved 9/4/02
Family Birth Centre. (1997). *Statistics for the year July 1995 until June 1996*. Melbourne: Royal Women's Hospital.
Fjelland, R., & Gjengedal, E. (1994). A theoretical foundation for nursing as a science. In P. Benner (Ed.), *Interpretive Phenomenology: embodiment, caring, and ethics in health and illness*. California: SAGE Publications.
Flew, A., Speake, J., & Mitchell, S. (1979). *A dictionary of philosophy*. London: Pan Books.
Fusako, S. (1990). *An experiment in water birth by mutual agreement between the mother-to-be and the midwife*. Paper presented at the 22nd International Confederation of Midwives. "A midwife's gift: love, skill and knowledge", Kobe, Japan.
Garland, D. (2000). *Waterbirth: An attitude to care* (2000 ed.). Oxford: Books for Midwives.
Garland, D., & Jones, K. (1994). Waterbirth, 'first-stage' immersion or non-immersion? *British Journal of Midwifery, Vol 2*(No 3), 113-20.
Geanellos, R. (2002). Transformative change of self: The unique focus of (adolescent) mental health nursing? *International Journal of Mental Health Nursing, 11*, 174-85.
Geissbuhler, V., & Eberhard, J. (2000). Waterbirths: a comparative study on more than 2,000 waterbirths. *Journal of Fetal Diagnosis and Therapy, 15*(no 5), pp 291-300.
Gibbins, J., & Thomson, A. M. (2001). Women's expectations and experiences of childbirth. *Midwifery, 17*, 302-13.
Gilbert, R. E., & Tookey, P. A. (1999). Perinatal mortality and morbidity among babies delivered in water: Surveillance study and postal survey. *British Medical Journal, 319*(7208), 483-7.
Glazener, C., Abdalla, M., Stroud, P., Naji, S., Templeton, A., & Russell, I. T. (1995). Postnatal maternal morbidity: extent, causes, prevention and treatment. *British Journal of Obstetrics & Gynaecology, 102*(April 1995), 282-7.
Goer, H. (1995). *Obstetric Myths versus Research Realities: A guide to the medical literature*. Connecticut: Bergin & Garvey.
Gordon, Y. (1990). Water Birth. In *Water Birth*. London: HarperCollins.
Grabowska, C. (2000). Alternative therapies for pain relief. In M. Yerby (Ed.), *Pain in Childbearing: Key issues in management* (pp. 93 - 109). London: Bailliere Tindall.
Grant, B., M, & Giddings, L., S. (2002). Making sense of methodologies: A paradigm framework for the novice researcher. *Contemporary Nurse, 13*(1), 10 - 28.
Grbich, C. (1999). *Qualitative Research in Health: An introduction*. New South Wales, Australia: Allen & Unwin Pty Ltd.
Greipp, M. E. (1992). Undermedication for pain: An ethical model. *Advances in Nursing Science, 15*(1), 44-53.
Guba, E. G., & Lincoln, J. S. (1981). *Effective Evaluation*. San Francisco: Jossey-Brass.
Guilliland, K., & Pairman, S. (1995). *The midwifery partnership: A model for practice*. Wellington: Department of nursing and midwifery, Victoria University of Wellington.
Hall, J. M., & Stevens, P. E. (1991). Rigor in feminist research. *Advanced Nursing Science, 13*(3), 16-29.
Hall, S. M., & Holloway, I. M. (1998). Staying in control: women's experiences of labour in water. *Midwifery, 14*, 30-6.

Halpern, S. H., Leighton, B. L., Ohlsson, A., Barrett, J. F. R., & Rice, A. (1998). Effect of epidural vs parenteral opioid analgesia on progress of labour: A meta-analysis. *JAMA, 280*(24), 2105-10.
Harper, B. (2000). Waterbirth basics: From newborn breathing to hospital protocols. *Midwifery Today, Number 54*(Summer 2000), 9-15.
Henriksen, T. B., Bek, K. M., Hedegaard, m., & Secher, N. J. (1992). Episiotomy and perineal lesions in spontaneous vaginal deliveries. *British Journal of Obstetrics and Gynaecology, 99*, p.950-4.
Hodnett, E. (2002). Pain and women's satisfaction with the experience of childbirth: a systematic review. *American Journal of Obstetrics and Gynecology*(186), S160-72.
Hodnett, E. (2002). Pain and women's satisfaction with the experience of childbirth: a systematic review. *American Journal Obstetrics and Gynecology*(186), S160-72.
Holloway, I., & Wheeler, S. (1996). *Qualitative Research For Nurses*. London: Blackwell Science Ltd.
Hoope-Bender, P. t. (1997). *The demedicalization of childbirth*. Geneva: World Health Organisation.
House of Commons Health Committee. (1992). *Second Report: Maternity Services (Winterton Report)*. London: H.M.S.O. Publications Centre.
Hung, T. T. (1987). The role of Endogenous Opioids in Pregnancy and Anaesthesia. *Seminars in Reproductive Endocrinology, 5*(2), 161-9.
Jayaratne, T., & Stewart, A. (1991). Quantitative and qualitative methods in the social sciences: current feminist issues and practical strategies. In M. Fonow & J. Cook (Eds.), *Beyond methodology: Feminist scholarship as lived research* (pp. 85-106). Bloomington: Indiana University Press.
Johanson, R., & Newburn, M. (2001). Promoting normality in childbirth. *BMJ, 323*(17 November), 1142-3.
Johnson, P. (1996). Birth under water- to breathe or not to breathe. *British Journal of Obstetrics & Gynaecology, 103*(March 1996), pp 202 - 8.
Kearney, R., & Rainwater, M. (1996). Martin Heidegger (1889-1976). In R. Kearney & M. Rainwater (Eds.), *The continental philosophy reader* (pp. 23-47). London: Routledge.
Kennedy, H. P. (1995). The Essence of Nurse-Midwifery Care: The Woman's Story. *Journal of Nurse-Midwifery, 40*(no 5), 410 - 7.
Kidder, L. H. (1981). *Selltiz Wrightman & Cook's Research Methods in Social Relations* (4th ed.). New York: Holt, Rinehart and Winston.
Kidder, L. H. (1991). In *Research Methods in Social Relations* (6th ed.). Fort Worth, Texas: Holt, Rinehart and Winston.
Kildea, S. (1996). Underwater Births, Are They Safe? *The Australian Journal of Holistic Nursing, 3*(No. 1), pp 29-33.
Kitzinger, S. (1982). *Pregnancy and Childbirth*. Sydney: Doubleday.
Kitzinger, S. (1989). *Giving birth, how it really feels*. London: Victor Gollancz Ltd.
Kitzinger, S. (2000a). *Rediscovering birth*. London: Little, Brown and Company.
Kitzinger, S. (2000b). The waterbirth debate up-to-date. *MIDIRS Midwifery Digest, December 2000*(10:4), 470-2.
Koch, T. (1995). Interpretive approaches in nursing research: the influence of Husserl and Heidegger. *Journal of Advanced Nursing, Vol 21*(May), 827-36.
Korte, D., & Scaer, R. (1992). *A good birth, a safe birth* (3rd ed.). Boston: The Harvard Common Press.
Leboyer, F. (1975). *Birth Without Violence*. Norwich: Fletcher & Son Ltd.
Leonard, V. W. (1994). A Heideggerian phenomenological perspective on the concept of person. In P. Benner (Ed.), *Interpretive phenomenology: embodiment, caring, and ethics in health and illness* (pp. p.43-64). California: SAGE publications, Inc.
Lewison, H. (1994). Was East Herts Health Trust right to discipline waterbirth midwives? *British Journal of Midwifery, 2*(4), 146-7.

Lichy, R., & Herzberg, E. (1993). *The Waterbirth Handbook: A guide to the gentle art of waterbirthing*. Bath, U.K.: Gateway Books.
Lindsay, P. (1997). Complications of the Third Stage of Labour. In B. R. Sweet & D. Tiran (Eds.), *Mayes' Midwifery: a textbook for midwives* (pp. 703-18). London: Baillière Tindall.
LoBiondo-Wood, G., & Haber, J. (1997). *Nursing Research: Methods, critical appraisal, and utilization* (Fourth ed.). St. Louis: Mosby.
Lowe, N. (1996). The pain and discomfort of labour and birth. *JOGNN: Journal of Obstetric, Gynecologic, & Neonatal Nursing, 25*(1), 82-92.
Lundgren, I., & Dahlberg, K. (1998). Women's experience of pain during childbirth. *Midwifery, 14*, 105-10.
Mander, R. (1998). *Pain in Childbearing and its Control*. Oxford: Blackwell Science.
Mays, N., & Pope, C. (1995). Qualitative research: Rigour and qualitative research. *BMJ, 311*(8 July), 109-12.
McLoughlin, A. (1997). The 'F' factor: Feminism forsaken? *Nurse Education Today, 17*, 111-4.
McNabb, M. (1997). Maternal and fetal physiological responses to pregnancy. In B. R. Sweet & D. Tiran (Eds.), *Mayes' Midwifery: a textbook for midwives* (12th ed., pp. 123-47). London: Baillière Tindall.
Mercy Hospital for Woman Southern Health Service and Women's & Children's Health Service. (October 2001). *Three centres consensus guidelines on antenatal care, .* Melbourne, Victoria,.
Mercy Hospital for Women. (2000). Use of baths in the Family Birthing unit. In A. Sprague (Ed.). Melbourne: Personal correspondence.
Miller, D. (1990). *Birth at Home*. Moorebank NSW: Doubleday.
Minichiello, V. (1999). *Handbook for research methods in health sciences*. Sydney: Pearson Education Australia.
Monash Medical Centre Family Birth Centre. (2001). Policy for use of water during labour and birth. In A. Sprague (Ed.). Melbourne: Personal correspondence.
Monti, E. J., & Tingen, M. (June 1999). Multiple Paradigms of Nursing Science: Nursing Theory For The 21St Century. *Advances in Nursing Science, Volume 21*(4), pp 64-80.
Moore, S. (1997). Physiology of Pain. In S. Moore (Ed.), *Understanding Pain and its Relief in Labour* (pp. pp. 23-46). Edinburgh: Churchill Livingston.
Morison, S., Hauck, Y., Percival, P., & McMurray, A. (1998). Constructing a home birth environment through assuming control. *Midwifery, 14*, 233-41.
Morison, S., Hauck, Y., Percival, P., & McMurray, A. (1999). Birthing at home: the resolution of expectations. *Midwifery, 15*, 32-9.
Morrin, N. A. (1997). Midwifery care in the first stage of labour. In B. R. Sweet & D. Tiran (Eds.), *Mayes' Midwifery: a textbook for midwives* (12 ed., pp. p.355-84). London: Baillière Tindall.
Murphy, P. A., & Feinland, J. B. (1998). Perineal outcomes in a homebirth setting. *Birth, 25*(4), 226-33.
Napierala, S. (1994). *Waterbirth: a midwives perspective*: Bergin & Garvey.
National Health and Medical Research Council. (1999). *National Statement on Ethical Conduct in Research Involving Humans*. Commonwealth of Australia, Canberra: NHMRC.
Nieswiadomy, R. M. (1998). *Foundations of nursing research* (3rd ed.). Stamford, Connecticut: Appleton and Lange.
Nikodem, V. C. (2000). Immersion in water in pregnancy, labour and birth. *The Cochrane Database of Systemic Reviews*(Issue 4).
Nissen, E., Lilja, G., Matthiesen, A.-S., Ransjö-Arvidson, A.-B., Uvnäs-Moberg, K., & Widström, A.-M. (1996). Effects of maternal pethidine on infants' developing breastfeeding behaviour. *Breastfeeding Review, 4*(No 2), 73-8.

Niven, C. A., & Murphy-Black, T. (2000). Memory for Labour Pain: A Review of the Literature. *Birth, 27*(4), 243-53.
Nurses Board of Victoria. (February 1999). *Code of Practice for Midwives in Victoria*. Melbourne: Victorian Government Printer.
O'Brien, W. (1997). Prolonged labour and disordered uterine action. In B. R. Sweet (Ed.), *Mayes' Midwifery: A textbook for midwives* (12 ed., pp. 623-31). London: Baillière Tindall.
Odent, M. (1984). *Birth Reborn*. London: Random House, Inc.
Odent, M. (1995). Birth under water: sink or swim. *British Journal of Obstetrics & Gynaecology*(102), 81-2.
Odent, M. (2000). A landmark in the history of birthing pools. *Midwifery Today, Number 54*(Summer 2000), p 17-8.
Odent, M. (2001). *The scientification of love*. London: Free Association Books Ltd.
Odent, M., & Johnson, J. (1994). *We are all water babies*. Limpsfield, Great Britain: Dragon's World Ltd.
Oiler, C. J. (1986). Phenomenology: The Method. In P. L. Munhall & C. J. Oiler (Eds.), *Nursing Research: A Qualitative Perspective*. Sydney Australia: Prentice-Hall.
Otigbah, C. M., Dhanjal, M. K., Harmsworth, G., & Chard, T. (2000). A retrospective comparison of water births and conventional vaginal deliveries. *European Journal of Obstetrics, Gynecology & Reproductive Biology, 91*, 15-20.
Paech, M. (1996). Pain relief during childbirth. *Current therapeutics*(July), 23-32.
Page, L. A. (2000). Keeping birth normal. In L. A. Page & P. Percival (Eds.), *The new midwifery: Science and sensitivity in practice* (pp. 105-21). Edinburgh: Churchill Livingstone.
Palmer, D. (1994). *Looking at philosophy: The unbearable heaviness of philosophy* (2 ed.). California: Mayfield Publishing Company.
Parratt, J. (2000). *Trusting enough to be out of control: the impact of childbirth experiences on women's sense of self.* University of Southern Queensland, Toowoomba.
Parratt, J., & Sprague, A. (1999). *Planned homebirth in Victoria, Australia 1995-1998.* Victoria: Unpublished report, Midwives in Private Practice Victoria.
Pederson, C. A., Caldwell, J. D., Jirikowski, G. F., & Insel, T. R. (1992). Oxytocin in maternal, sexual and social behaviors. *Annals of the New York Academy of Sciences, 652*.
Perinatal Data Collection Unit. (1999). *Annual report for the year 1999*. Melbourne: The Consultative Council on Obstetric and Paediatric Mortality and Morbidity,.
Perinatal Data Collection Unit. (2001). *Births in Victoria 1999-2000*. Melbourne: The Consultative Council on Obstetric and Paediatric Mortality and Morbidity,.
Piaget, J. (1972). *Insights and illusions of philosophy* (W. Mays, Trans.). London: Routledge & Kegan Paul.
Plaat, F. (1998). Options for relieving pain in labour. *Pulse, June 13*, 62-5.
Plager, K. A. (1994). Hermeneutic Phenomenology: A methodology for family health and health promotion study in nursing. In P. Benner (Ed.), *Interpretive Phenomenology: embodiment, caring, and ethics in health and illness* (pp. 65-83). California: SAGE Publications.
Polit, D. F., & Hungler, B. P. (1997). *Essentials of Nursing Research: Methods, Appraisal, and Utilization.* (4 ed.). New York: Lippincott.
Ponette, H. (1999). *Waterbirth in the 21st Century*. Ostend: The NPO Aquarius.
Price, C. (1995). *Water Birth and Land Birth: A Comparative study of maternal and neonatal outcomes in one Australian birth centre.* Unpublished Master of Nursing Coursework, The University of Sydney, Mallett Street Campus, Camperdown, NSW, Australia.
Ray, M. A. (1994). The Richness of Phenomenology: Philosophic, Theoretic, and Methodologic Concerns. In J. M. Morse (Ed.), *Critical Issues in Qualitative Research Methods* (pp. 117-33). California: SAGE Publications.

Read, G. D. (1970). *Childbirth without fear*. New York: Harper & Row.
Redwood, R. (1999). Caring control: methodological issues in a discourse analysis of waterbirth texts. *Journal of Advanced Nursing, 29*(4), 914-21.
Reiger, K. M. (2001). *Our bodies, our babies: the forgotten women's movement*. Melbourne: Melbourne University Press.
Reinharz, S. (1992). *Feminist methods in social research*. New York: Oxford University Press, Inc.
Rice, P. L., & Ezzy, D. (1999). *Qualitative Research Methods: A health focus*. Melbourne, Australia: Oxford University Press.
Righard, L. (2001). Making childbirth a normal practice. *Birth, 28*(March 2001), pp1-4.
Rittman, M., Paige, P., Rivera, J., Sutphin, L., & Godown, l. (1997). Phenomenological study of nurses caring for dying patients. *Cancer Nursing, 20*(2), 115-9.
Roberts, C. L., Tracy, S., & Peat, B. (2000). Rates for obstetric intervention among private and public patients in Australia: a population based descriptive study. *British Medical Journal, 321*, 137-41.
Roberts, K., & Taylor, B. (1999). *Nursing Research Processes: an Australian perspective*. South Melbourne, Victoria: Nelson Thomson Learning.
Roberts, K., & Taylor, B. (2002). *Nursing research processes: an Australian perspective* (2nd ed.). Australia: Nelson.
Robinson, J. (1993). A waterbirth death in Sweden. *AIMS Journal*(5), 13-4.
Rosevear, S., Fox, R., Marlow, N., & Stirrat, G. M. (1993). Birthing pools and the fetus. *British Medical Journal, 342*(October 23).
Rush, J., Burlock, S., Lambert, K., Loosley-Millman, M., Hutchison, B., & Enkin, M. (1996). The effects of Whirlpool Baths in Labour: A Randomized, Controlled Trial. *Birth, 23*(3 September), 136-43.
Shute, N. (1997, Nov 10). No more hard labour. *U.S. News & World Report,* pp. 92-5.
Sidenbladh, E. (1983). *Water Babies: Igor Tjarkovsky's method of delivering and training children in water*. London: A & C Black.
Simkin, P., Whalley, J., & Keppler, A. (2001). *Pregnancy, childbirth and the newborn: the complete guide*. New York: Meadowbrook Press.
Smithbattle, L. (1994). Beyond normalizing: the role of narrative in understanding teenage mothers' transition to mothering. In P. Benner (Ed.), *Interpretive Phenomenology: embodiment, caring, and ethics in health and illness*. California: SAGE Publications.
Spurling, L. (1977). *Phenomenology and the social world*. London: Routledge & Kegan Paul.
Squire, C. (2000). Pain relief: past and present. In M. Yerby (Ed.), *Pain in Childbearing: Key issues in management* (pp. 1 - 15). London: Bailliere Tindall.
Steer, P., & Flint, C. (1999). ABC of labour care: Physiology and management of normal labour. *British Medical Journal, 318*(20 March), 793-6.
Streubert, H. J., & Carpenter, D. R. (1995). *Qualitative Research in Nursing: Advancing the Humanistic Imperative*. Philadelphia: J. B. Lippincott Company.
Streubert, H. J., & Carpenter, D. R. (1999). *Qualitative Research in Nursing: Advancing the Humanistic Imperative* (second ed.). Philadelphia: J. B. Lippincott Company.
Stuhlmiller, C. M. (1994). Narrative methodology in disaster studies. In P. Benner (Ed.), *Interpretive Phenomenology: embodiment, caring, and ethics in health and illness*. California: SAGE Publications.
Sweet, B. R. (1997). Physiology and care of the newborn. In B. R. Sweet & D. Tiran (Eds.), *Mayes' Midwifery: a textbook for midwives* (pp. p. 783-800). London: Baillière Tindall.
Telfer, F. M. (1997). Relief of pain in labour. In B. R. Sweet & D. Tiran (Eds.), *Mayes' Midwifery: a textbook for midwives* (pp. 418-54). London: Baillière Tindall.
Ten Steps to Successful Breastfeeding. (1989). *Protecting, promoting and supporting breast-feeding:the special role of maternity services*. Geneva: World Health Organisation a joint WHO/UNICEF statement,.

Thorp, J. A., & Breedlove, G. (1996). Epidural analgesia in labour: An evaluation of risks and benefits. *Birth, 23*(2), 63-81.
Tjarkovsky, I. (Personal communication July 1990,). Delivering and training children in water. Melbourne 1990: Annie Sprague.
Tracy, S. (2002). *Costing the cascade: Estimating the cost of increased obstetric interventions in childbirth using population data*. Paper presented at the XVIII European congress of perinatal medicine and New Zealand College of Midwives, Oslo, Norway and Dunedin, New Zealand.
Van Manen, M. (1990). *Researching Lived Experience: Human science for an action sensitive pedagogy* (1990 ed.). London, Ontario: The State University of New York.
Van Santen, J. (2001). Review says breastfed for longer. *Medical Observer*(25 May 2001), p7.
Wagner, M. (1994). *Pursuing the birth machine: The search for appropriate birth technology*. Camperdown, Australia: Ace Graphics.
Waldenström, U., & Nilsson, C.-A. (1992). Warm tub bath after spontaneous rupture of the membranes. *Birth, 19*, 57-63.
Walker, J. (1994). Birth underwater: Sink or swim. *British Journal of Obstetrics & Gynaecology, 101*, 467-8.
Webb, C. (1992). The use of the first person in academic writing: objectivity, language and gatekeeping. *Journal of Advanced Nursing, 17*, 747-52.
Weller, D. J. (2002). *Submission to the HFA on Maternity Referral Guidelines; obstetric epidurals*: New Zealand National Committee of the Australian and New Zealand College of Anaesthetists.
Wild, L. R. (1993). Caveat emptor: A critical analysis of the costs of drugs used for pain management. *Advances in Nursing Science, 16*(1), 52-61.
Woodman, I. (2002). *Breast feeding reduces risk of breast cancer, says study*. Retrieved 29/7/02, 2002
World Health Organization. (2002). *Postpartum care of the mother and newborn*. Retrieved 11/3/02, 2002
Yegdich, T. (1999). On the phenomenology of empathy in nursing: empathy or sympathy? *Journal of Advanced Nursing, Vol 30*(1), 83-93.
Yerby, M. (2000). *Pain in childbearing*. London: Bailliere Tindall.
Zander, L., & Chamberlain, G. (1999). ABC of labour care: Place of birth. *BMJ, 318*(13 March), 721-3.

APPENDIX A

DATA COLLECTION TOOL

Number	
Maternal Age	Years
Gravida Parity	G1/P0 =1 G2/P0 =2 G3/P0 =4 G4/P0 =5 G5/P0 =5
Gestation	37/40 =1 38/40 =2 39/40 =3 40/40 =4 41+/40 =5
Length 1st stage Hrs & Min	Hrs Min
Length 2nd stage Hrs & Min	Hrs Min
Perineal status	Intact =1 1st degree tear =2 2nd degree tear =3 3rd degree tear =4 Episiotomy =5 Episiotomy + tear =6
Blood Loss In Mls	Mls
Place of birth	Air =1 Water =2
Non Pharmacological Analgesia	No analgesia =1 Water immersion>1hr =2 Water> 1hr & birth =3 Water for birth only =4 Homeopathy =5 Homeopathy & water =6
Pharmacological Analgesia	Inhalants =1 Opiates =2 Inhalants & opiates =3 Epidural/Spinal =4 Anaesthesia =5
Apgar score @1min	=
Apgar score @5min	=
Resuscitation	No resuscitation =1 O2 / tactile stimulation =2 Resuscitation & Narcan =3
Admission to Neonatal Nursery	Yes =1 No =2
Infection in mother	Yes =1 No =2
Knot in cord	Yes =1 No =2
Physical anomaly in neonate	Yes =1 No =2
Shoulder Dystocia	Yes =1 No =2

APPENDIX B

I am presently undertaking a master of nursing, research. I have chosen to study the effect of water immersion upon childbirth. There is a wealth of research into water & birth overseas, but little Australian research. Many Maternity hospitals have now installed baths in labour wards & birthing suites, but have made policies & procedures about who, when & why women can/not use the tubs without using evidence to make these clinical decisions.

My research will be both quantitative and qualitative (women's experience of water as a means of pain control).

I would like to invite women who gave birth to their first child and who used water during childbirth to "tell me their story of their birth, in particular the time they spent in water.

I would like to interview 6 women. They will remain anonymous and no personal information will be kept about them.

I really want to know what it felt like to use a deep pool of water during labour and if women thought that there was any difference being in the water and out on land.

It would involve me coming to your home at a time convenient to you, or any other place you choose and taping your story. This will take 30mins. After transcribing the tapes, I will then re contact you and recheck your comments regarding the use of water during labour.

I have chosen women who gave birth to their 1st baby because they have statistically higher rates of intervention especially narcotics and epidurals as well as assisted births (forceps & c/s). This research could become a powerful persuader of women's rights to use water during labour!

For more information please contact;

Annie Sprague Independent midwife, 34 Shiers st, Alphington 3078

Melbourne Phone (03) 9497 3625 Business, Home 94430354

E-mail to spragues@optushome.com.au

APPENDIX C

Australian Catholic University

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT	**AN INVESTIGATION INTO THE INFLUENCE OF WATER UPON THE EXPERIENCE OF GIVING BIRTH**

NAMES OF SUPERVISORS: **Ms Maria MILLER & Mrs Catherine MANTERFIELD**

NAME OF STUDENT RESEARCHER: **Ms Anne SPRAGUE, Master of Nursing (RESEARCH)**

The broad aims of this study are: To investigate the influence of deep-water immersion in labour on women's experience of birth. There is no contemporary Australian research addressing water use during childbirth although there is much published research from overseas. As more and more women are selecting to use water as a method of pain relief during labour, it is appropriate that Australian research be conducted into its use to assist women and midwives make informed choices.

I would like to know about your personal experience of using water during childbirth. If you agree to participate, I will ask you to tell me about your birth, in particular, the time spent in water. This semi-structured, audiotaped interview will take approximately one hour and will be conducted at your home or a place of your choice, at a time convenient to you. Participation in this study is voluntary and you are at liberty to withdraw consent at *any time* without being required to indicate why you are withdrawing.

Results of this research may appear in professional and consumer publications however you will not be identified in any way and your name will not be made available to any person. The data regarding women's experience of using water during childbirth will be made available to you on request.

Ethical clearance has been gained from the Human Research Ethics Committee at the Australian Catholic University: St Patrick's Campus. In the event that you have any complaint or concern about the way you have been treated during the study, or if you

have any query that the Supervisor and Student Researcher have not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee.

Chair, HREC
C/o Research Services, Australian Catholic University
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3157 Fax: 03 9953 3305

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

Please take time to familiarise yourself with the contents of this letter before completing. If you agree to participate in this project, you should sign both copies of the Consent Form, retain one copy for your records and return the other copy to Student Researcher, Anne Sprague.

Yours sincerely,

SIGNATURE OF PRINCIPAL SUPERVISOR ……..

SIGNATURE OF STUDENT RESEARCHER……

APPENDIX D

Australian Catholic University

CONSENT FORM

TITLE OF PROJECT	**AN INVESTIGATION INTO THE INFLUENCE OF WATER UPON THE EXPERIENCE OF GIVING BIRTH**

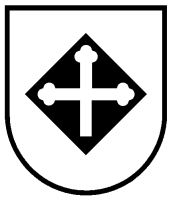
NAMES OF SUPERVISORS: **MS Maria MILLER & Mrs Catherine MANTERFIELD**

NAME OF STUDENT RESEARCHER: **Ms Anne SPRAGUE, Master of Nursing (RESEARCH)**

I ..... *(the participant)* have read (*or, where appropriate*, have had read to me*)* and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

SIGNATURE OF PARTICIPANT: ……DATE……

SIGNATURE OF STUDENT RESEARCHER:……DATE……



Australian Catholic University

CONSENT FORM **Participants Copy**

TITLE OF PROJECT	**AN INVESTIGATION INTO THE INFLUENCE OF WATER UPON THE EXPERIENCE OF GIVING BIRTH**

NAMES OF SUPERVISORS: **MS Maria MILLER & Mrs Catherine MANTERFIELD**

NAME OF STUDENT RESEARCHER: **Ms Anne SPRAGUE, Master of Nursing (RESEARCH)**

I *..... (the participant)* have read (*or, where appropriate*, have had read to me*)* and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

SIGNATURE OF PARTICIPANT: ……..DATE……

SIGNATURE OF STUDENT RESEARCHER:……..DATE……..