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UNIVERSITY OF SOUTHAMPTON

FACULTY OF HEALTH SCIENCES

**‘Women’s experiences of Transcutaneous Electrical Nerve Stimulation
(TENS) for pain control in labour’**

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Doctorate in Clinical Practice

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ABSTRACT

FACULTY OF HEALTH SCIENCES

Doctorate in Clinical Practice

**WOMEN'S EXPERIENCES OF TRANSCUTANEOUS ELECTRICAL NERVE
STIMULATION (TENS) FOR PAIN CONTROL IN LABOUR**

Lucinda Shawley

The vision for maternity services focuses on women-centred care with choice, control and promoting normality at its centre, thus emphasising the need to empower women to make choices and decisions regarding their care in labour and birth. Some women will choose the medical model of care, however others prefer to be in control and choose to use non-pharmacological alternatives for pain control in labour such as Transcutaneous Electrical Nerve Stimulation (TENS). TENS has enabled the provision of non-invasive, mobile, self-controlled pain relief for women in labour and is used extensively by women in the UK who, when asked, assess it favourably and say they would use it again. Currently the available literature on TENS fails to consider individual women's experiences of using TENS for labour and birth, this study therefore seeks to redress this balance.

Set in the south of England, the study uses Interpretative Phenomenological Analysis (IPA) in order to explore the experiences of twenty purposively selected women, who were interviewed to expose their in-depth experiences of using TENS for pain control in labour and birth. The analysis of the verbatim transcripts revealed comprehensive findings ensuring an idiographic focus along with making claims for the larger group of women. In this study women used TENS as part of a combination of more natural pain control or as a 'sole' form of pain control for labour and birth. TENS was recognised as being part of a wider strategy for the maintenance of control in labour and normal birth for women. A super-ordinate theme of 'control' emerged from the data particularly relating to 'internal control of self', 'external control of others' and 'control of the TENS machine'. Women's positive experiences were enhanced by remaining mobile, using drug free pain control, being knowledgeable, having partners' and midwives' support, being distracted from their pain and trusting in TENS.

By uncovering a group of women's in-depth experiences of using TENS for pain control in labour and birth this study has filled a "gap" in the knowledge base. In addition, the findings suggest that TENS was identified as an 'enabling mechanism' for the women in order to be in control of a normalised birth. Women were able to maintain their independence, make decisions and actively take part in their pain control using TENS.

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DECLARATION OF AUTHORSHIP

I, LUCINDA SHAWLEY, declare that the thesis entitled:

‘Women’s experiences of Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour’

and the work presented in the thesis are both my own, and have been generated by me as a result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at the University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- none of this work has been published before submission.

Signature:

Date:

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DEFINITIONS

TENS

Transcutaneous Electrical Nerve Stimulation.

‘Low-risk’

Uncomplicated pregnancies, singleton pregnancy, cephalic presentation, women having a straight forward normal vaginal birth.

‘High-risk’

Women that have had a forceps, ventouse or caesarean delivery, have had an epidural or pethidine as analgesia in labour or have had other complications such as pre-eclampsia and diabetes.

Primi-gravid

Women pregnant with their first baby.

Multi-gravid

Women pregnant with second, third or subsequent baby.

Phenomenology

The study of everyday life as it is actually lived and experienced. Phenomenology is the first major theoretical underpinning of IPA.

Hermeneutics

The theory of interpretation. Hermeneutics is the second major theoretical underpinning of IPA.

Interpretive phenomenological analysis (IPA)

A technique for analysing qualitative data which seeks the meaning of experience, which then attempts to unravel the meanings contained in accounts through a process of interpretative engagement with the text and transcripts.

Idiography

Is concerned with the particular, has commitment to the sense of detail and depth of analysis and focuses on the individual.

Double Hermeneutic

The researcher is trying to make sense of the participant trying to make sense of what is happening to them.

Heideggerian Hermeneutics

The goal is to study how people interpret their lives and make meaning of what they experience. The role of the researcher and their knowledge and experience are accounted for and are an important part of the research.

The Hermeneutic Circle

Is concerned with the dynamic relationship between the part and the whole, at a series of levels and is used in the analysis of the research. The circle can also reflect the dynamic between the researcher and the participant.

CHAPTER 1 INTRODUCTION

This study explores and interprets women's experiences of using Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour. The interpretation of the meaning of women's experiences was important in achieving the aims of the study: Interpretative Phenomenological Analysis is used in order to do this. The study focuses on twenty women who chose to use TENS for pain control in labour within an area in the South of England.

This chapter introduces the research study. It begins by giving an overview of TENS, its background, uses and application and briefly outlines the gate control theory and the production of endorphins. It then moves on to look at labour and pain relief and the more recent policy drivers within the context of midwifery practice. The rationale for undertaking the research study and the research aims are identified. Finally, the chapter concludes by setting out the structure of the remainder of the thesis. Two literature reviews were carried out in the study. Firstly, a preliminary literature review that focused on TENS (Chapter 2) was updated as part of the preparation for writing the thesis and secondly, a literature review was required in order to support the discussion of the findings (Chapter 5).

1.1 An overview of Transcutaneous Electrical Nerve Stimulation (TENS)

Transcutaneous Electrical Nerve Stimulation (TENS) is a non-pharmacological, non-invasive pain-relief method that has been proven effective for a variety of conditions. It is portable, easy to use and quick to discontinue if necessary and has been favourably reported for use during labour and delivery (Johnson, 1997; Padma *et al*, 2000; Van der Spank *et al*, 2000; Chao *et al*, 2007; Wang *et al*, 2007). It is important that midwives support women if they choose to use TENS for pain control in labour. The UKCC (1991) stated that 'midwives may, on their own responsibility, manage pain relief in labour by the use of transcutaneous electrical nerve stimulation, (TENS) provided that they have received adequate and appropriate instruction'.

Over the last thirty years the tide has moved towards finding alternative methods of managing labour pain which are either drug-free or enable very little use of drugs, are non-invasive (Smith *et al*, 2006) and can be controlled by the woman and which do not have

adverse side-effects to mother and/or child. One of these alternative methods of pain management is TENS. TENS can be used as a background level of pain relief to which other pain relief methods can be added or it can be used on its own (Blincoe, 2007). TENS has been found to be as effective as Entonox (Chia *et al*, 1990) and can be used by patients who wish to be ambulant in labour. Price (2000) suggests that it would be more appropriate to view TENS not as a form of pain relief, but as a method for women to self-manage their pain. It could, therefore be recommended that the use of TENS is considered as a method of pain ‘control’, not pain ‘relief’, as complete relief is not what is required for all women but ‘control’ of labour is paramount for many women (Mander, 1992; McDonald, 2006).

1.2 The Transcutaneous Electrical Nerve Stimulation (TENS) Unit

TENS is delivered via a small battery-powered, hand-held unit containing the generator of ‘squared’ electrical impulses, characteristics such as the amplitude and frequency varying with different models. A low voltage electric current is transmitted to the skin via surface electrodes, which results in a “buzzing” or “tingling” sensation. The labouring woman can control the unit herself, increasing or decreasing the volume of the output and frequency of impulses. Most TENS units used in obstetrics contain two channels, each of which is connected to an independently controlled pair of electrodes. Thus, the woman may experience different sensations from the two pairs of electrodes. Quality of sensation is also varied by the placement and size of the electrodes (Augustinsson *et al*, 1977).

Usually the TENS unit’s intensity is set just below the pain threshold for the woman. This level remains constant between contractions. During contractions the woman, or her partner, may increase the intensity to a level, which competes successfully with the pain of her contraction, using a “boost” button to increase the frequency. The electrodes may be rubber pads, using gel to allow good skin contact and adhesive surgical tape to keep them firmly in place, alternatively, self-adhesive pads may be used.

Wall and Melzack (2006) recommended that one pair of pads are placed at the level of T10-L1 and the other at the level of S2-S4, about 5cms on either side of the spine. The pads overlie the roots of the afferent nerves serving the uterus and cervix, vagina and perineum respectively. Once in place, TENS does not restrict the mobility of the women. This is an important factor in helping her to retain self-control and from the midwife’s

point of view, keeping the woman mobile can often shorten her labour and assist in the descent of the baby through the birth canal.

TENS is more effective if applied early in labour, and usually takes approximately forty minutes to begin to take effect. It is important that the midwife caring for the woman is knowledgeable regarding TENS and can therefore assist in its correct application and monitor its use. Many studies do not address this important issue. However, experience in the use of TENS and ‘working with women’ to support them through their labour and delivery has increased awareness in this area. The only contraindications in the use of TENS, are that TENS should not be used if the woman has a cardiac pacemaker, any heart problems or epilepsy and it should never be applied to the neck or head and should not be used whilst operating machinery (or driving a car). TENS has no known side effects to mother or baby.

1.3 The ‘Gate control theory’ and the production of endorphins/enkephalins

TENS was devised in a laboratory by scientists discovering pain mechanisms (Melzack & Wall, 1965). This is perhaps the reason for the majority of the research on TENS being of mainly quantitative and of scientific/experimental design. Melzack & Wall (1965) proposed the “gate control theory of pain”. This stated that pain impulses are mediated in the gelatinous substances in the spinal cord. The dorsal horns of the spinal cord act as “gates”, controlling the entry of pain signals into the central pain pathways.

Melzack & Wall’s (1965) initial theory spurred on considerable further research into the physiology and psychology of pain. New approaches to treatment emerged based on the prediction that pain might be lessened by applying electrical stimulation to nerve fibres in the skin. When electrical waves are applied it seems to impair the transmission of painful stimuli from the periphery to the central nervous system. Melzack & Wall (1965) believed that these procedures produce sensory inputs and inhibit pain signals by closing the “gate” in the spinal cord.

McMahon and Koltzenburg (2006) suggested that the introduction of the gate control theory in 1965 by Melzack and Wall has acted as a catalyst for the global proliferation of different techniques for pain alleviation based on afferent stimulation, such as TENS. McMahon and Koltzenburg (2006) also highlighted that despite the clear physiological and analgesic effects of TENS, its clinical effectiveness remains an issue or debate in the

medical literature. However, they stated that TENS is a modality that is clearly able to elicit physiological changes in the central and peripheral nervous system that can be linked to analgesic effects.

According to Salar *et al* (1981), the “gate control theory of pain” was paralleled by the discovery of endorphins (morphine-like substances occurring naturally in the body) and enkephalins (opioid substances found in the brain), both of which have an analgesic effect. The effectiveness of TENS is attributed to its two-fold action. Firstly, it blocks incoming painful stimuli (the gate control theory of pain), and secondly it stimulates the production of natural endorphins and enkephalins. During the late 1960s and 1970s, small portable battery operated machines call Transcutaneous Electrical Nerve Stimulators were developed.

1.4 Labour and pain relief

The experience of labour pain is a complex, subjective, multidimensional response to sensory stimuli generated during parturition (Wall and Melzack, 2006). McDonald (2006) has contributed to writing on pain issues in obstetrics and discusses the pain of childbirth and the considerable impact it has on the mother, the fetus, and the newborn. McDonald (2006) highlighted, that current practices emphasize the safety of the mother and her baby while considering also the serious impact of pain during both the first and second stages of labour. The practice of obstetric anaesthesiology now tends to harmonize the compassionate side of pain relief, with the safety and concerns for health and welfare of the woman and child.

On the other hand the modern theory of pain management in labour and delivery points out that pain should and must be relieved effectively, as persistent severe pain and its stress can generate harmful effects for the mother and possibly the fetus (McDonald, 2006). It seems therefore, that there are two schools of thought here, one being to ‘control’ pain and the other to ‘relieve or eliminate’ pain completely during labour. Women fall into these two broad groups – ‘the control group’ and the ‘elimination group’ depending on their views and ideas about pain management (McDonald, 2006).

Labour pain is the result of many complex interactions, physiological and psychological, excitatory as well as inhibitory. Physiologically, pain during the first stage of labour

occurs when the cervix starts to dilate because of compressed uterine blood vessels when the uterus contracts (Blackburn, 2003). This continues throughout the first stage until complete dilation is achieved. There is then a notable reduction of nociceptive signals, but uterine contractions persist even against impressive forces of resistance. Furthermore, the severity of pain parallels with the duration and intensity of contractions. The pain that develops in the second stage emanates from continued distension of the entire vaginal canal as the baby descends towards the vaginal outlet. Some of the painful signalling comes from muscular tension and tearing during this final descent and dilatation of the birth canal (Wall and Melzack, 2006). In the second stage of labour additional factors, such as traction and pressure on the parietal peritoneum, uterine ligaments, urethra, bladder, rectum, lumbosacral plexus, fascia and muscles of the pelvic floor increase the intensity of pain (Rudra, 2004). The physiological process of labour and birth therefore cannot be a pain free process for most women.

Individual pain perception depends on the intensity and duration of the contractions, the speed at which the cervix dilates, the physical condition of the woman as well as a complexity of emotional factors such as previous experiences, present expectations, and cultural factors (Steer, 1993). Undoubtedly psychological factors do affect the incidence and intensity of parturition pain and impact on the mental attitude and mood of the woman during labour. Thus, fear, apprehension and anxiety further enhance pain perception and pain behaviour (McDonald, 2006).

Blincoe (2007) highlighted that managing pain during the stages of labour is a key priority for all midwives (and expectant mothers) and has mainly been tackled with the use of pharmacological methods such as epidural analgesia, opioids and Entonox. There are however, adverse side-effects to mother and/or child from the use of some of these pharmacological methods. Pethidine is the most commonly used intramuscular opioid and requires accurate timing of administration. Pethidine, as with other opioids, can induce maternal and neonatal respiratory depression and decrease APGAR and neurobehavioural scores in the neonate (Levy, 2007). Although epidural analgesia is currently seen as the most effective way to combat labour pain it is also linked to prolonging labour time which can cause the unborn child distress and it increases the risk of instrumental delivery as it decreases a woman's ability to push (Torvaldsen *et al*, 2004, Anim-Somuah *et al*, 2005). Some studies have argued that it also increases the caesarean section delivery rates (Fogel *et al*, 1998).

According to Wall and Melzack (2006), at the outset, it should be stated that a sophisticated level of anaesthesia care is not necessary for all women for their labour and delivery. Some mothers in fact want to feel the movements, rotations, and downward progress of their baby in the birth canal. Natural childbirth with the use of more natural therapies such as being mobile, using water, breathing and relaxation have been used with great success for some relief of labour pain. In some instances, poor understanding of the effects of the emotional and psychological aspects of labour and delivery have hindered the use and acceptance of these natural methods of pain relief by obstetricians.

There is a tendency to ‘medicalise’ a normal biological event, turning it into a ‘medical problem’, and thus converting the pregnant woman into a passive dependent ‘patient’, which has not helped the way that women are cared for on the labour ward. The inference is that technology is supreme, the woman is dependent on it and on the institutions and individuals who control and dispense it (Wall and Melzack, 2006). Obstetricians have specialist knowledge of childbirth that stems primarily from medical science. Women on the other hand, have the expertise of a capacity to sense and respond to the sensations of their bodies (Wall and Melzack, 2006). The pain in childbirth, as explained by Helman (1994) is more than merely a neurophysiological event. There are social, psychological and cultural factors associated with childbirth that all need to be considered.

De Ferrer (2006) said that childbirth is an overwhelming experience which can leave women feeling powerless. Pain is expected in childbirth and midwives need to ensure that women are well informed, treated as individuals, taking their choices, beliefs and cultures into account.

Traditionally, the care of women in labour was aimed at providing pain *relief*. However, Mander (1992) suggested that now that this has become much more feasible, attention has been given to the source of pain control. When such control is lodged with the mother, she is able to experience the degree of pain which she finds acceptable. Physicians often assessed TENS as negative when comparing it to other pharmacological pain management methods. However, they were trying to eliminate pain, not control it.

Leap (2000) described pain in labour as a central part of women’s experience of childbirth and says that women have highlighted the fact that the attitudes of midwives have a profound effect on their experience of giving birth and pain in labour. Leap (2000) explored the midwifery perspective on pain in labour and described the pressure to offer

‘pain relief’ within the labour ward culture, and the personal discomfort experienced by midwives around being with women in pain. Leap (2000:50) identifies two ‘belief systems’ or ‘ways of seeing things’ one being the dominant paradigm of ‘pain relief’ and the other paradigm of ‘working with pain’. ‘Working with pain’ is embodied in midwifery knowledge and philosophy and includes ideas of practical, emotional, cultural, ethical and philosophical aspects of pain in labour.

The concept of ‘working with pain’ (Leap, 1999) and enabling the woman to release her body’s own pain relieving chemicals demands a versatile midwifery approach. A midwife that ‘works with pain’ is developing an understanding of ‘normal pain’ as part of the process of labour. The concept enables midwives to ‘sit back’ and deal with any potential discomfort in themselves raised by the woman’s expression of pain. ‘Abnormal pain’ is associated with abnormal labour and then ‘pain relief’ is usually appropriate in such cases. Midwifery knowledge is a key concept of ‘keeping birth normal’ and that enabling childbearing women to take power and become confident and therefore in control of their pain is paramount (Leap, 2000). The ‘two ways of seeing things’ as described by Leap (2000:50), lead us into the next section where they will be outlined in the context of the study within midwifery.

1.5 The context of the study within midwifery

There are two paradigms or belief systems within midwifery care that affect choices of analgesia in labour. Advances in technology continue at a fast pace within obstetrics, particularly with the dominant medical model of care and elective epidural provision. Some women are passive (Blakka and Schauer, 2008), they do not want to feel pain and want the professionals to take control and make their decisions for them. A proportion of women will be high risk due to obstetric or medical problems and others prefer or simply choose the technocratic medical model of care. Women often fear childbirth and want others to manage them in order that they feel safe in hospital (Heinze and Sleigh, 2003).

In the opposite belief system or paradigm women do not want to experience a medical model of care, which is managed and controlled. These women want a natural model of care, they actively engage, seek knowledge and want to be in control of their childbirth. They want to promote a more natural childbirth and the experience that goes with it. These women often have less fear, engage with professionals and need support to make choices

and decisions for themselves. Women who hold this belief system often have aims for a home birth, birth centre experience or a midwife-led birth in hospital and want a normal outcome. Within this belief system pregnancy and birth are seen much more as normal physiological processes, in which medical intervention is inappropriate unless it is clinically indicated and evidence-based. Midwives can assist by promoting the normal pathway, using their expertise in normal birth, and supporting women who choose to use non-pharmacological pain control, such as TENS.

These two paradigms are seen as opposite ends of the spectrum, however the two paradigms or belief systems are not discrete paradigms, they have a whole continuum or vast area in between them that influences all aspects of care, for example choice of analgesia for labour and birth.

The publication of 'Towards a Healthier Nation' (1999) highlighted the growing awareness of the limitations of the medicalised model of maternity care. Following this, 'Vision 2000', drawing on the views of midwives and other key stakeholders, stated that 'maternity care is not just a delivery service: it makes a major contribution to family wellbeing and wider public health'. It identified the need 'to create a service which listens to women' and highlighted that pregnancy and childbirth are not isolated clinical incidents, but major life events of enormous psychological and social significance for women and their families. It is vital that women feel able to exercise informed choice and control over their care at this time. Part of this informed choice relates to whether women choose to use pharmacological analgesics or to use more natural methods of pain control. Both require support from the professionals who are providing care for women.

Current policies such as Midwifery Matters (2007) and Midwifery 20:20 (2010) recognise these two paradigms and belief systems and reflect them. They acknowledge for instance that women focus on analgesia for labour and birth and that in the medical model of care women that choose not to suffer pain may request an epidural. Alternatively women with the opposite belief system may have considered the option of using pharmacological analgesia and with the knowledge and information available to her, she may choose to use other forms of non invasive, natural pain control of which TENS may be considered.

Midwives have a responsibility to ensure that all women receive care that is based on the notion of partnership and which respects the individuality of a woman and her family. Women have the right to make their own decisions and midwives have a duty to provide

them with evidence based information so that they can make choices for care (NMC, 2008). Midwives care for a huge spectrum of women with varying beliefs to which they bring their own beliefs and experience in providing this service for women. Provision of care is complex and multi-layered with the belief system of the woman, the beliefs of the midwife and societies' expectations of what a midwifery service should provide.

In our changing society, the norms and expectations surrounding childbirth are interwoven with an increasing reliance on technology and rising intervention rates. Set against this is the drive to promote normality. The National Service Framework (2004), Maternity Matters (2007) and now Midwifery 20:20 (2010) advocate that women should be supported to have as normal a pregnancy and birth as possible, with medical interventions recommended only if they are necessary and are of benefit to the woman and her baby. With the shift in service provision, comes a shift in the attitudes, beliefs, and behaviour of childbearing women and their families, and a re-evaluation of what is considered culturally and socially to be the norm.

Maternity Matters (2007) stated that –

‘Individualised care offered by a midwife, specialist support provided to those most at risk and normal birth without medical intervention will become a more realistic option for every parent’ (DoH 2007:4).

Throughout the midwifery and community childbirth organisations, the idea of ‘normal birth’ is being debated and promoted as never before (Darra, 2009) particularly in the light of increasing intervention in childbirth. National and international guidelines which underpin maternity service provision encourage ‘normal’ birth practices (WHO, 1996; National Childbirth Trust (NCT), 2007; National Institute for Health and Clinical Excellence, NICE 2007) with an underlying aim to reduce costly birth interventions. Intervention is continuing to increase and in 2006, normal birth rates in the UK fell below 50% for the first time whilst rates of intervention continued to rise (Birthchoice UK, 2008). Furthermore, the International Confederation of Midwives (ICM, 2005) updated their definition of the role of the midwife to include ‘promotion of normal birth’ as a key part of the role. Normal birth is therefore very much on the agenda for midwives and providers of maternity services in terms of providing safe, appropriate care for women and defining professional roles.

The RCM and three other Royal Colleges have published new minimum standards for care in labour, underscoring the need for multidisciplinary teamwork and sufficient staffing levels in order to provide women-centred care (Safer Childbirth, RCOG, 2007). Women and their babies sit at the heart of these recommendations. The report intends to include an evaluation of women's views of their care and should inform the regular review of service provision and risk management. Safer Childbirth (RCOG, 2007) supports the NSF (2004) and Maternity Matters (2007) in highlighting safety, normality, women's choice and involvement and a focus on wide accessibility as key elements of a high-quality service which should be community and midwifery based. The NSF (2004) supported applying research findings to the development of locally based guidelines and protocols. This therefore highlighted that women's experiences need to be heard and interpreted in order that they can contribute through the generation of research evidence for policy and practice in midwifery care.

The experience of labour pain is complex and women's choices for analgesia in labour and birth depend on the woman's belief system. These are viewed differently having been shaped by women's individual ideas, feelings, knowledge, past experience and present expectations. The medically managed paradigm where the aim is to relieve or eliminate pain using pharmacological analgesia such as opioids and the use of elective epidurals is chosen by some women. The opposite paradigm where the normal or more natural pathway that actively involves women in their control of labour pain using methods such as breathing, mobilisation and TENS in order to promote normal outcome is preferred by other women. TENS has been part of this paradigm or belief system for women who want to remain in control, actively take part in their labour and seek non-pharmacological pain control. This research study has therefore investigated this by asking women about their experiences of TENS for pain control in labour and birth.

1.6 Aims of the study

This study aimed to explore, understand and interpret women's in-depth experiences when using Transcutaneous Electrical Nerve Stimulation (TENS) as a form of pain control in labour.

The current research evidence on TENS remains inconclusive and studies have repeatedly used only quantitative methods to investigate or assess TENS. It became evident through

reviewing the literature that women's experiences had not previously been sought on TENS. Therefore this study used a qualitative research approach to address this issue. The study investigated why women chose to use TENS, found it helpful for pain control, would use it again and frequently recommend it. The women and their experiences were the focus of the study in order to provide evidence for practice and the planning of future midwifery care and research possibilities. The study's aims were achieved by interviewing and interpreting the findings of the study relating to women's experiences of TENS for pain control in labour.

1.7 Rationale for undertaking the study

The impetus for undertaking the study arose from personal, professional and academic experiences, which have influenced and stimulated my continued interest in the use and development of TENS over the last 25 years.

I have been interested in the use of TENS in midwifery practice since being a student midwife when I was first introduced to TENS as a form of pain control for women having low risk home births in the community. Later, I was involved in the design of a new TENS machine where women were asked their views on the practicalities of the machine, for example the size of the TENS pads, the ease of the controls, the length of the wires and the sensation. On reflection, I wonder if this early involvement triggered my long term interest in the use of TENS for labour. Later I became nominated as the TENS expert for our Trust, I have since frequently been asked for advice by midwives and women about TENS. This initiated a further interest in teaching, formally, student midwives and antenatal women on the use and application of TENS.

Throughout my midwifery career woman-centred care has always been my focus. I have worked predominantly in the community supporting women who choose to use, amongst other things TENS, many being my own caseload of women. Most women used TENS successfully as an integral part of their labour and birth. I began to ask why TENS seemed to be effective. I have recently changed my role and currently manage a birth centre. This has allowed me to gain a much broader view of TENS' use by the team of midwives and a larger group of women.

A reflective diary and audit trail were started at the beginning of the research in order to acknowledge the fact that I am a midwife by profession and I am the researcher in this study. I was aware that I would be ‘interpreting the women’s interpretation’ (a double hermeneutic) of their experiences and acknowledge that other readers will come to their own conclusions after reading this study. In order to minimise bias, enhance credibility and encourage reflexivity the audit trail and reflective rationale are included in the thesis.

As a researcher, looking at an area within clinical practice, it became evident that there was a need to provide research evidence on the use of TENS in practice, and therefore to produce evidence for policy. The available evidence is currently not representative of the women and their views on TENS. A synthesis of previous studies has found relevant facts that have often been overlooked or not disseminated into practice, such as the antenatal education of TENS to student midwives and partners as well as women. Finally, women are questioning the effects of pharmacological analgesia for labour on themselves and their babies, highlighting the need to search for safe non-invasive alternatives such as TENS which supports normal birth physiology.

This current study therefore -

- Focused on TENS as a method of pain ‘control’ in labour
- Explored the women’s experiences
- Addressed an identified gap in the current evidence-base for TENS in labour
- Used a research approach that is appropriate to the study aims.

1.8 Organisation of the Thesis

The thesis comprises of a further 5 chapters:

- Chapter 2 details the preliminary literature review on TENS in labour in order to look closely at the available evidence and substantiates the aims and rationale for the current study.

- Chapter 3 outlines the study design, data collection and data analysis methods.
- Chapter 4 presents in detail the findings of the study. This detailed presentation reflects the IPA approach underpinning this study.
- Chapter 5 provides a substantive discussion and relates the findings to the relevant literature
- Chapter 6 draws the work to a close. It summarises the women's experiences, highlights limitations and draws together the recommendations for practice, education and research. The chapter ends with a short concluding section.

CHAPTER 2 THE LITERATURE REVIEW OF TENS

A literature review was conducted prior to undertaking this research study in order to firstly, review the available literature on the use of TENS in labour and secondly, to determine whether or not research had been undertaken that focussed on women's experiences of TENS in labour. In order to do this national and international literature incorporating randomised and non-randomised studies were gathered together to form an analysis of the evidence. Stories, commentaries and editorials were omitted from the review as these are often based on personal opinion rather than research evidence. Older studies were included to ensure an understanding of the origin and development of TENS was gained as well as current available literature. The literature confirmed that TENS had attracted much attention regarding its use in obstetrics for labour and delivery.

The search strategy for the TENS literature review is detailed in Table 2.1 and explained in Appendix 1. The search history is detailed in Appendix 2.

Table 2.1 Search strategy for the TENS literature review

Type of literature included:-	Search terms & key words:-	Search using clinical databases:-	Other forms of searching for evidence:-
National and International literature Systematic reviews Randomised control trials Non-randomised control trials Quantitative studies Qualitative studies	'Transcutaneous electrical nerve stimulation' 'TENS' 'Labour pain' 'Pain relief/control' 'Labour' 'Women's experiences' (combined to narrow the search down)	BNI - British Nursing Index MEDLINE - A major index to biomedical literature EMBASE - has a more European base than Medline CINAHL - Cumulative Index of Nursing and Allied Health Literature THE COCHRANE LIBRARY	MIDIRS - Midwifery digest BJM - British Journal of Midwifery NMI - Nursing Midwifery Index 'GOOGLE' as a search engine-Internet search Policies and Guidelines- NICE (National Institute for Clinical Excellence) Department of Health Documents RCM (Midwives Rules)

The literature presented in this chapter details and updates the original review undertaken at the outset of the study in order to better contextualise information presented in subsequent chapters. The summary of included studies (Appendix 3) details the thirty studies that were critically reviewed including their methodology, sample size and findings. No qualitative studies were found relating to TENS and women's experiences.

This lack of evidence confirmed the existence of a ‘gap’ in the research literature related to women’s experiences of TENS and confirmed the appropriateness of undertaking the current study.

The literature found consisted of two systematic reviews, three surveys, fourteen randomised controlled trials (RCTs) and eleven other types of quantitative studies. Four appraisal tools were used to critically appraise the literature (Table 2.2).

Table 2.2 Tools used for appraisal of reviewed literature

Type of research study (number of studies)	Appraisal tool used-Reference
Systematic Reviews (2)	CASP –Critical Appraisal Skills Programme http://www.phru.org.uk/casp.htm
RCTs (14)	CASP –Critical Appraisal Skills Programme http://www.phru.org.uk/casp.htm
Surveys (3)	CASP –Critical Appraisal Skills Programme http://www.phru.org.uk/casp.htm
Quantitative studies (11)	Cluett, E., Bluff, R (2000) Principles and practice of research in midwifery. Bailliere Tindall.

The following sections present a synthesis of this literature highlighting the main points of relevance to the study. These set the study in the wider context of the TENS literature and clearly show the existence of a gap in knowledge surrounding the experiences of women using TENS in labour: the present study seeks to fill this gap.

2.1 The study pioneering TENS in labour

Augustinsson *et al* (1977) pioneered the use of TENS for labour pain and conducted one of the first studies using TENS. In view of the relatively positive results and since there were no complications TENS was recommended, at the end of the study, as a primary pain relieving measure to which conventional methods of pain relief could be added as needed. These early reports of TENS’ success resulted in the design of specialized obstetric TENS devices with dual channel output and ‘boost’ controls for contraction pain. The development of TENS machines specifically designed for labour has continued since then (Wall and Melzack, 2006) and several authors (Harrison *et al*, 1986; Kaplan *et al*, 1998; Lee *et al*, 1990) identified the need for further improvements in TENS devices aimed specifically to cope with the quality of pain in labour.

2.2 The effects of TENS

A number of effects of TENS have been highlighted in the literature. These are listed in Box 2.1 below and then discussed one by one.

Box 2.1 Areas where the effects of TENS have been highlighted in the literature

TENS:

Alleviates labour pain
Is an alternative to pharmacological analgesia
Is non-invasive
Enables women to remain mobile
Provides distraction
Enhances the ability to concentrate
Enables relaxation
Affects the duration of labour
Has no effects on the baby
Does not interfere with fetal monitoring
Provides backache relief

2.2.1 Alleviating labour pain

There is much debate about the nature of pain in labour and delivery and the possibility and desirability of eliminating this type of pain completely (Carroll *et al*, 1997). This is a particularly contentious issue when consideration is given to TENS as a mechanism for pain alleviation and to which there seems to be no clear answer as to its effectiveness. If complete pain relief is desired TENS is not the method of choice as Robson (1979) reported early in the research history of the obstetric use of TENS – an effective epidural, in this instance is the only option.

Caroll *et al* (1997) conducted a systematic review of TENS concluding that ‘TENS has no significant effect upon pain in labour’ and that ‘women should be offered more effective interventions for the relief of pain in labour’. However, in this study fewer additional analgesics were needed by the ‘TENS’ group though this was not explored further. It was also suggested that ‘women who are offered TENS are at risk of having their pain inadequately controlled and may experience delays in receiving effective interventions’. A later review by Dowswell *et al* (2009) challenged Caroll *et al* (1997). They remind readers that the experience of pain is complex, women did find TENS helpful and it had no adverse effects therefore women should have the choice of using TENS in labour. Both systematic reviews included RCTs that used unconventional TENS devices using Limoges

currents, which are administered transcranially and clearly differ from conventional placement of obstetric TENS (Johnson, 2001).

The NICE guidelines (2007: 6.3.1) based their recommendations on Caroll *et al*'s review and as such have not recommended TENS for women in established labour. Since the guidelines were published there has been considerable debate about their appropriateness and the efficacy of the evidence upon which they are based – this will be discussed later.

Kaplan *et al* (1997) reminded us that much of the early work on TENS was to establish its scientific base rather than its clinical application. TENS has been shown, in practice, to be successful in alleviating the pain of labour and because of this patients and medical staff should be encouraged to use TENS (Kaplan *et al*, 1997). They also suggested that health care professionals should try the TENS device and familiarise themselves with the sensations caused by electrical stimulation, in order to better explain TENS to women and their partners. Additionally they suggested that TENS could be used as a 'stand alone' method of pain control for women. Padma *et al* (2000) found that patients having short labours had difficulty in obtaining satisfactory analgesia with conventional methods thereby offering the possibility that TENS, with its rapid onset of pain relief, may have some analgesic potential for those having short labours.

Despite the lack of conclusive evidence of its effectiveness in alleviating labour pain when compared to other methods of pain relief in randomised control trials (Carroll *et al* 's, 1997). TENS is used extensively by women throughout the UK, in both home and hospital settings, in order to relieve pain in labour and delivery (Johnson, 1997). Although women have stated that they find that TENS has a positive effect on pain (Augustinsson *et al*, 1977; Grim and Morey, 1985; Johnson, 1997; Kaplan *et al*, 1997) and that they would use TENS again, there is little concrete evidence underpinning its effectiveness.

According to Johnson (2001) the findings of the systematic reviews have been questioned as they contrast with clinical experience and it would be inappropriate to dismiss the use of TENS until the reasons for the discrepancy between experience and published evidence is fully explored. The present study is designed to explore the experiences of women using TENS in labour and therefore may shed light on issues surrounding the alleviation of pain. More recently McMunn *et al* (2009) acknowledged in their survey that the evidence base for using TENS with women in labour is poor yet midwives remain keen to support the use of TENS.

2.2.2 An alternative to pharmacological analgesia

In the research studies reviewed, the effectiveness of TENS was often assessed by the amount of pharmacological analgesia a woman needed (Van der Ploeg *et al*, 1996; Lee *et al*, 1990). Epidural analgesia and narcotic drugs may be the chosen form of pain control for some women, however, they are not without contraindications and complications. This was the rationale for Kaplan *et al*'s (1998) study which found that TENS application reduced the duration of the first stage of labour and the amount of analgesic drug administered.

Harrison *et al* (1986) found that women who had TENS and Entonox were significantly less likely to require further analgesia than those treated with a placebo TENS and Entonox. Grim & Morey (1985); Bortuluzzi (1989); Bundsen *et al*, (1981); and Miller Jones (1980) all found the use of additional analgesia such as pethidine was reduced in women using TENS. Similarly, in Harrison *et al*'s (1981) and Nesheim's (1981) studies the use of requests for epidurals were lower in the TENS group; although in Nesheim's study this was accounted for by apparent observer bias. Carroll *et al* (1997), Nesheim (1981) and Thomas *et al* (1988) thought that TENS did not have a significant effect on labour and women should be offered other effective interventions.

Van der Spank *et al* (2000) noted a swing away from conventional and invasive types of analgesia (e.g. nitrous oxide, pethidine, spinal and epidural anaesthesia) and a movement towards more non-invasive techniques for pain management in labour and delivery. It was against this background that TENS was introduced and became more popular with women. The most important identified benefits of TENS during labour were that it is non-invasive, safe, easy to apply and remove, it has no side-effects, it does not interfere with consciousness, there is no point in labour when it is too late to apply TENS and the mother remains alert and mobile and is in control (whereas conventional modes of analgesia are invasive, prevent mobility and affect the baby as well as the mother). However, in order to use TENS to its full potential it is vital that all women are taught how to use the TENS apparatus, and all should experience TENS stimulation prior to labour.

2.2.3 The non-invasive nature of TENS

TENS is a natural, non-invasive drug free analgesic widely used in obstetrics. Despite the lack of studies proving that TENS alleviates pain, it has become a popular tool for women

in the early stages of labour. Although opinion among users varies, anecdotal evidence suggests that it generally provides some benefits. With no side effects for both mother and baby the portable TENS unit allows the labouring women control and management over her own pain relief, an important factor in her overall experience of childbirth (De Ferrer, 2006).

For many years women have been searching for non-invasive approaches to pain relief in labour and delivery which would have minimal effects on themselves and their babies (Davies, 1989). In relation to TENS, Davies' (1989) small survey confirmed women's questioning of the effects that various forms of pain relief had and suggested that the non-invasive nature of TENS was an important consideration when deciding about pain relief.

Davies (1989) also suggested that community midwives should consider applying TENS at home to reduce the hours spent on the admission wards and delivery suites. The use of TENS at home (Davies, 1989; Dowswell *et al*, 2009; Van der Spank *et al*, 2000) may decrease the time women spend on labour wards and has been overlooked by studies that only considered TENS for use when women were admitted to hospital (Augustinsson *et al*, 1977; Bortoluzzi, 1989; Bundsen *et al*, 1981; Chia *et al*, 1990; Crothers, 1994; Dockter *et al*, 2004; Edwin *et al*, 1990; Erkkola *et al*, 1980; Grim and Morey, 1985; Labreque *et al*, 1999; Lee *et al*, 1990; Miller Jones, 1980; Neisheim, 1981; Robson, 1979; Thomas *et al*, 1988; Van der Ploeg *et al*, 1996). More evidence is needed to guide practice in relation to the effects of TENS.

Because TENS is non-invasive its use allows women to remain mobile. Being mobile and able to adopt postures other than lying supine on a bed during labour and delivery were positively mentioned in three studies. Miller Jones (1980) regarded mobility and adopting various positions as affecting comfort and the ability of women to cope with pain. Stewart (1979) found that the women in the TENS group felt more comfortable and more able to cope with their labours as they were mobile and able to adopt various positions. TENS therefore allowed freedom of movement. Van der Spank *et al* (2000) commented that the use of TENS enabled the mother to remain alert, mobile and in control whilst in labour.

2.2.4 TENS provides distraction, enables women to concentrate and relax

Even in the earliest studies of TENS women reported noticing that they were distracted from their feelings of pain by using TENS (Stewart, 1979; Robson, 1979; Davies, 1989). In some instances distraction was accompanied by suggestibility (Stewart, 1979).

Although the studies do not explain the nature and quality of distraction, Miller Jones (1980) and Grim & Morey (1985) pointed out the importance of it to the women. In their studies they turned the TENS machines off for a number of contractions. The women reacted by asking for it to be turned back on immediately, thus indicating that there was benefit in using TENS. The present study, in exploring the experiences of women using TENS, may help us to understand better how women perceive TENS as benefitting them in labour and delivery. More recently Van der Spank *et al* (2000) reported TENS as having a 'distraction element' and because of this suggested that women should experience the sensation prior to labour to become more familiar with it.

In addition to finding that TENS distracted women from their pain, Stewart (1986) found that its use also helped women to relax. Grim and Morey (1985) found that TENS improved women's ability to concentrate in labour and improved their use of breathing and relaxation techniques. Why TENS should promote relaxation and enhance concentration, other than through alleviating pain, is poorly understood and the present study may shed light on this.

2.2.5 The duration of labour and effects on the baby

Kaplan *et al* (1998) and Padma *et al* (2000) found that TENS reduced the first stage of labour and the overall duration of labour. In Padma *et al*'s (2000) study labour duration was reduced by 120 minutes for primips and 77 minutes for multipips.

None of the studies in the literature review found that TENS had an effect on neonatal outcomes or had side effects on the baby (Dowswell *et al*, 2009; Chao *et al*, 2007; Padma *et al*, 2000; Lee *et al*, 1990; Bundsen *et al*, 1982; Harrison *et al*, 1986; Kaplan *et al*, 1998; Miller-Jones, 1980).

Additionally, it is interesting to note that despite Bundsen and Ericson's (1982) claims that TENS might interfere with electronic fetal monitoring no studies in this review reported this, thus confirming the earlier work of Edwin *et al* (1990).

2.2.6 Backache relief

Some of the studies found that TENS was of benefit for back pain in labour (Thomas *et al*, 1988; Van der Spank *et al*, 2000). In Miller-Jones (1980) study 82% of women obtained relief from back pain, similarly, Padma *et al* (2000) reported over 50% of study participants (53% of primips and 64% of multips) had good to excellent relief of back pain using TENS.

2.3 What women felt about TENS

Despite the lack of qualitative studies focussing on the women's experiences Johnson's (1997) large questionnaire survey (10,077 participants) provided information on satisfaction by seeking the women's views after their experience with TENS in labour. The study suggested that some degree of pain relief occurred during TENS administration.

Many studies have documented how TENS was rated by women: these have been brought together in Table 2.3. They enable a pattern of positive comments to emerge even though the use of TENS remained inconclusive in many studies. This appears to show very strong evidence of a preference for TENS and satisfaction with the use of TENS.

Table 2.3 Showing ratings of TENS (%) and future recommendations from TENS literature review studies

Authors and Rating of TENS (mainly expressed in % of women in each study)	Authors and Future Recommendation (women that showed a preference to use TENS again)
<p>Augustinsson et al 1977 88% good to moderate</p> <p>Bortoluzzi 1989 75% rated a decrease pain with TENS</p> <p>Erkkola et al 1980 86% in TENS group had good relief</p> <p>Grim and Morey 1985 87% got relief from TENS</p> <p>Harrison et al 1986 more favoured TENS in TENS group</p> <p>Hughes et al 1988 96% rated TENS versus 62% placebo</p> <p>Johnson 1997 71% reported excellent relief (14% used TENS alone)</p> <p>Kaplan et al 1998 72% primips and 69% multipips considered TENS effective</p> <p>Miller Jones 1980 82% had relief from back pain and 71% from abdominal pain</p> <p>Nesheim 1981 TENS group more positive rating</p> <p>Padma et al 2000 53% of primips and 64% of multipips received relief from back pain</p> <p>Robson 1979 82% TENS was of some benefit (25.7% used TENS alone)</p> <p>Van der Spank et al 2000 96% degree of satisfaction with TENS</p>	<p>Hughes et al 1988 93% would use again</p> <p>Chao et al 2007 98% versus 66% in TENS placebo would use again</p> <p>Davies 1989 49/50 would use again</p> <p>Dowswell et al 2009 majority would use again</p> <p>Grim and Morey 1985 majority would use again</p> <p>Johnson 1997 93% would use again</p> <p>Kaplan et al 1998 67% primips and 69% multipips would use TENS again</p> <p>Miller Jones 1980 76% would use TENS again</p> <p>Thomas et al 1988 more women in the TENS group would use TENS in future labours (even though no positive findings for TENS in study)</p> <p>*it is important to note that other studies did not express that women would not use TENS in the future, no comments were made either way.</p>

2.4 Education

Davies' (1989) study was one of the only ones to consider education in the form of antenatal classes for women, midwives, student midwives and partners. He recommended that it was important for women to control their own pain relief and that midwives should have instruction on the correct positioning and application of TENS to enable women to do this.

In the light of this it is interesting to note the findings of McMunn *et al*'s (2009) survey. This survey of maternity units in England found that whilst they overwhelmingly supported the use of TENS only 7.9% of midwives received training on TENS. Additionally, a critique of the NICE (2007) guidelines showed that they were not being adhered to by midwives and as a result women were continuing to use TENS for pain control in or throughout labour. However, it is important to note that only 17.9% of

midwifery units in the UK had TENS for pain control and this may have had an impact on TENS use and therefore midwives' need for knowledge.

One of the benefits of providing education to student midwives was shown by Stewart (1979) who suggested that when the student midwives were instructed in the theory and use of TENS in their training, they increased personal contact between patient and attendant.

Van der Spank *et al* (2000) recommended that all women were taught how to use TENS and suggested that all should experience TENS stimulation prior to labour. Little is known from the studies reviewed about partners' and birth companions' educational needs with only Davies' (1989) study having mentioned these.

2.5 The practicalities of TENS

Although in most studies reviewed women used a particular TENS machine it is possible to make some tentative claims about some of the practicalities of using TENS. However, it is also important to emphasise the patchiness of availability of TENS machines in maternity units and the unequal nature of access nationally (McMunn *et al*, 2009). Most women hire, borrow or buy TENS machines independently to ensure that they are available when they need them.

Padma *et al* (2000) and Erkkola *et al* (1990) acknowledged that TENS is safe, simple and of low cost. Wang *et al* (2007) reported that TENS is simple, cheap, safe and convenient as well as being widely accepted by patients. The majority of studies recommended that the TENS pads should be placed on the woman's back in line in a particular way (see Chapter 1). This was recommended by Melzack and Wall (1965), Augustinsson *et al* (1977) and more recently confirmed by Wall and Melzack (2006). Bundsen *et al* (1981) applied TENS pads to the supra-pubic region and Carroll *et al* (1997) and Dowswell *et al* (2009) described limoge currents being used, which were administered transcranially: neither of these approaches are currently used in the placement of obstetric TENS.

Two recent studies have looked at the application of TENS to acupuncture points to relieve labour pain. When doing this Chao *et al* (2007) found significant differences between the TENS and the TENS placebo group and recommended that TENS could be a non-invasive

adjunct for pain relief in the first stage of labour. Wang *et al*'s (2007) study identified the possibility that TENS, applied to acupuncture points could strengthen uterine contractions and therefore accelerate labour (this dual effect is not seen in any analgesic drugs).

Dowswell *et al* (2009) also found that women receiving TENS to acupuncture points were less likely to report severe pain.

Augustinsson *et al*'s (1977) pioneering study recommended the development of dual channel output machines and boost controls. Lee *et al* (1990) recommended higher intensity TENS machines to be available as the machine they used for their study was not powerful enough and women reached the maximum intensity early on in their labours. Since these studies were published TENS machines have been greatly improved in terms of sensation, control and portability.

2.6 A comment on research designs and TENS

The majority of studies used 'high risk' samples of women for instance, those undergoing induced labours, having twins, women who were post-term or had toxæmia (Augustinsson *et al*, 1977; Davies 1989; Dockter *et al* 2004). TENS was often started after induction when the pain was severe (Erkkola *et al*, 1980). This choice of sample means that little is known about low risk women. The present study purposely focussed on low risk women in order to understand their experiences of using TENS.

Seven studies in the review limited women's mobility in several ways by using interventions. Augustinsson *et al*'s (1977) sample of women included high risk women, women undergoing induction of labour, with toxæmia, those attached to fetal heart rate monitors and intrauterine catheters. However, despite these interventions they state that women can *actively* take part in their labour. Whilst they could certainly be active in their labours through decision making, it was unlikely that they would remain easily mobile. Chia *et al* (1990) used a sample of surgically induced women in order to observe labour from the start and again state, as a result of their study that TENS could be used for women who wish to remain mobile even though for most of their sample mobility was reduced. Davies (1989) used a high risk sample of women including some who had had induced labours, twins or fetal scalp clips attached in order to monitor their babies (this was also the case in Robson's (1979) study). Edwin *et al* (1990) similarly used electronic fetal monitoring which limited mobility and freedom in labour, Erkkola *et al* (1980) induced

women with oxytocin in the TENS group but commented that women were ambulant, and in Van der Ploeg *et al's* (1996) study women were attached to a patient-controlled analgesia (PCA) system and a cardiotocograph monitor. In this instance the women's mobility is likely to have been restricted mechanically and the PCA's content of narcotic drugs would have also affected the women's consciousness. It is clear that mobility has been restricted in many of the studies reviewed. This is an area warranting further attention given the recognised importance of maintaining mobility in the progress of labour (Simpkin and Ancheta, 2005).

Visual analogue scales were used in many studies (Docker *et al*, 2006; Edwin *et al*, 1990; Labreque *et al*, 1999; Thomas *et al*, 1988; Van der Ploeg *et al*, 1996; Wang *et al*, 2007) as a way of assessing pain and the effectiveness of the pain relief that women received. However, the use of these scales has been questioned by several researchers. Underlying the use of standardized scales are the assumptions that patients should not experience pain, and that all pain should be relieved. Simkin and Klaus (2004) explained that the application of this approach to labour pain is problematic. Labour pain is not pathological, it involves physiological, psychological, and sociological aspects. Pain is not equivalent to suffering. The intensity of labour pain does not necessarily correlate with a bad experience of labour and finally, whilst measuring pain carries the implication that it must be relieved, not everyone wants labour pain relief in the form of medical interventions (Simkin and Klaus, 2004).

Some studies used other types of pain scales (Bortoluzzi, 1989; Chia *et al*, 1990; Crothers, 1994; Davies, 1989; Erkkola *et al*, 1980; Grim and Morey, 1988; Harrison *et al*, 1986; Kaplan *et al*, 1998; Stewart, 1986). However many were not specific about how these were used. Simkin and Klaus (2004) noted that using pain scales and removing all pain pharmacologically forces clinicians into a provider-centred model of labour care. This dependence is quite different to the values of woman-centred care in childbirth in which the midwife and systems recognise a woman's own competency and self efficacy.

Woman-centred care assesses the importance of the labour experience, the meaning of pain to the woman, and the implications for the woman of removing the pain through medical interventions. Rather than taking power away from the labouring woman, woman-centred care places the meaning of pain into perspective and highlights the life-affirming and life-changing aspects of the woman's birth experience.

Doctors and obstetricians have traditionally placed high value on numerical data, which may in reality be misleading to the real practice issues. The literature review on TENS consisted of all quantitative studies with a large proportion of RCTs. However it is not feasible for RCTs to be the only source on which to base clinical decisions, as not all situations or interventions can be evaluated this way (Walsh, 1996; Page, 1997). Similarly, RCTs have already been identified by many as ignoring the views of the women who use TENS (Walsh, 2007; Dowswell *et al*, 2009; Price, 2000; Coates, 2000). Roe (1993) therefore suggested that it would not be appropriate to limit systematic reviews within midwifery to randomised controlled trials, as this would not capture the body of midwifery knowledge or women's perspectives.

Black (1994) agreed and advocated that the increasing popularity of qualitative research in the biomedical sciences has arisen largely because quantitative methods provided either no answers or the wrong answers to important questions in both clinical care and service delivery. This is certainly the case within the TENS literature where clinical practice does not currently reflect the research evidence base because quantitative studies have not detailed why women choose to use TENS, what it is about the TENS that they find helpful and why a large percentage of women would use TENS again.

2.7 NICE guidelines

Midwives have been requested to base clinical practice on the intrapartum NICE guidelines (2007) relating to the use of TENS for pain control in labour. These guidelines are based on the systematic review of RCTs (Carroll *et al*, 1997) and do not recommend TENS use on the grounds on its ineffectiveness to reduce pain in labour. However a recent review by Dowswell *et al* (2009) challenged this guidance, and there was evidence that some women choose TENS as their preferred method of pain relief regardless of the NICE guidance. Mander (1998) emphasised the popularity of TENS with women, which interestingly offsets the impact of the methodological weaknesses in many of the reviewed studies. In other words women are demanding TENS either regardless of the guidance or in ignorance of it. In addition to this midwives are also still recommending that women use TENS.

McMunn *et al*'s (2009) survey of all maternity units in England demonstrated overwhelming support for TENS use. They concluded that the combination of a dearth of

robust evidence together with midwives' beliefs that TENS should be an available pain relieving option. Walsh (2007) supported this stating that:

'TENS has been used in labour for a few decades now. Carroll *et al*'s (1997) systematic review was pessimistic regarding the value of TENS as a pain-relieving agent, concluding only weak positive effects. (There was some evidence of secondary analgesic sparing, and women expressed a preference to use it for future labours). Their summary that 'RCTs provide no compelling evidence for TENS having any analgesic effect during labour' illustrates the susceptibility of trials to subjective interpretation. The method, premised on objectivity and the elimination of bias, fails to take seriously the inevitable reflexive posture of authors influencing trial interpretation. Here maternal preference is deemed a tertiary outcome and undervalued in the summation of the study (Walsh, 2007:59).

Much of the available research on TENS has used scientific methods of enquiry often involving experiments which have tried to control variables which in practice cannot be controlled. Walker and Sofaer (2003) argued that the 'gold standard' double-blind randomised controlled trial is impracticable, particularly in clinical practice. None of the designs used by the studies reported in this literature review have sought in-depth information about the experiences of women using TENS in labour. The present study does this in the hope of understanding better why women (despite the lack of evidence supporting the effectiveness of TENS) chose to use this particular approach to pain control.

2.8 Conclusion

The literature search identified only quantitative research studies that were inconclusive with regards to the effectiveness of TENS. However, some of these studies did suggest that women liked TENS, assessed it favourably and would use it again in subsequent labours. Women required less pharmacological analgesia, such as pethidine, had a shorter first stage of labour and no adverse effects from TENS for the mother and baby were reported.

Salmon (1999) discovered that much of the research, including Cochrane reviews, shared one crucial omission in their methods. This was an evaluation of the maternal perspective and raised the importance of not just involving women users in the evaluation of specific

childbirth interventions but of also consulting with them when drawing up any future research agenda.

Completing this literature review raised questions about the study designs used to investigate TENS and why no qualitative research regarding TENS had been undertaken. This seemed particularly pertinent in the present climate of increased awareness and responsibility among women towards the management of their labour pain, the greater knowledge of birth choices available to them, and the knowledge that many women are questioning the effects of pharmacological methods of pain relief (Davies, 1989) and wanting to avoid these methods where possible (Van der Spank *et al*, 2000).

The review confirmed firstly, that little is known about women's individual experiences of using TENS for pain control in labour; this study seeks to redress this balance. Secondly, it also confirmed that the 'Research Question' could not be answered using a quantitative design. A qualitative study was necessary to find out about women's experiences of TENS and understand why women like TENS and think that TENS is effective when there is so little concrete evidence to support the effectiveness of TENS.

3.1 The design of the study

Qualitative research faces new opportunities in a social world that is complex and where of understanding context and process could potentially be very highly valued (Mason, 2002). Qualitative research is exciting and important, it is a highly rewarding activity because it engages us with things that matter, in ways that matter. Through qualitative research we can explore a wide array of dimensions of the social world, including the texture and weave of everyday life, the understandings, experiences and imaginings of our research participants and the significance of the meanings that they generate (Mason, 2002). The Expert Group Changing Childbirth (1993), reiterated that the women should be central to all care, so the challenge for midwives is to ensure that women's views and experiences receive equal recognition as technological findings (DoH, 1993). Qualitative research is therefore justified in order to find out the views and experiences of women, and to document them in a way that can improve practice. Different designs of qualitative research were considered, and in view of the research aims and question, an interpretative design was appropriate to use and therefore chosen.

Three approaches to interpretative design were considered for this research study. All three approaches use inductive reasoning, in that they aim to bring knowledge into view. However, the particular perspective from which they seek to do this will vary according to orientation. Ethnography focuses on the description of culture and is a generalised approach to developing concepts to understand human behaviour (Morse and Field, 1996). The ethnography approach can be useful in health and social care research often using observation and 'field-work' in order to try to understand the influences and practices of a particular culture. Grounded theory, however, is an approach to research in which the aim is to collect and analyse qualitative data in order to develop theory which is 'grounded' in the data. This is more of a 'process orientated' approach and is often known as the 'constant comparison method' (Strauss and Corbin, 1990). Lastly, phenomenology is an approach to research that emphasises and seeks to explore the real life experience of an individual, and is the one selected for this study.

Phenomenology has the potential to enable women to express their feelings and experiences. A previous critical appraisal of all published midwifery research studies using a phenomenological approach (DClinP coursework) has re-affirmed the researchers'

beliefs about this research approach and the wealth of ‘life experience’ and ‘in-depth description’ that can be drawn from using this method. This approach is much more appropriate than ethnography or grounded theory for this research study and is discussed further below.

3.1.1 An overview of Phenomenology

A phenomenological approach provides a framework in which to explore the needs and experiences of women encountering the childbirth process. It allows depth of interpretation and expression of feelings and a glimpse of the experience to be revealed. Phenomenology attempts to understand and incorporate all aspects of the phenomenon rather than concentrating on a particular or specific concept. The philosophy of midwifery is based on individualised care incorporating the physical, emotional, social, psychological, spiritual and educational needs of women. This emphasis on holistic care fits perfectly with interpretative phenomenological enquiry as it links with midwifery and a woman centred philosophy.

Midwives have skills to facilitate the purpose of phenomenological enquiry and to use their clinical expertise and knowledge in uncovering the participants’ interpretation. A phenomenological approach is therefore well suited to this research study and was used to facilitate the uncovering of the experience of this phenomenon - women’s experiences of using TENS in labour - for the women in the study and to facilitate improvements in practice.

Phenomenology is an approach used within qualitative research that enables the researcher to delve into and gain an understanding of otherwise poorly understood phenomena (Robinson, 2000). In this instance the phenomena being referred to are ‘women’s experiences of using TENS in labour and delivery, whilst under the care of midwives’. Clarke and Wheeler (1992) suggested that phenomenology grew out of a need to understand the effects of experiences on individuals and was referred to by Bortorff (1990) as the study of everyday life as it is actually lived and experienced thus suggesting a good fit between the underlying research design and the question being studied. In addition to this the use of phenomenology as a research design fits well with the underpinning philosophy of midwifery - one that emphasises individual and holistic care (Robinson, 2000; Walsh and Downe, 2010).

A phenomenological approach allows the exploration of an individual's perception or account of an event (Smith, 1995). In phenomenology the researcher seeks a deeper and fuller meaning of the experience of the participants of a particular phenomenon and as such offers the possibility of providing descriptive, reflective and interpretative accounts of the experience being studied (Van Manen, 1990).

There are a variety of philosophical approaches to phenomenology. Edmund Husserl (1927) first argued that experience should be examined in the way that it occurs, and in its own terms. Husserl (1927) believed that the researcher should 'bracket' or put to one side one's preconceptions. Heidegger (1962), once a student of Husserl had a different view and emphasised his divergence suggesting that his work was more phenomenological than Husserl's, which was too theoretical and abstract. Heidegger proposed that one cannot suspend one's own preconceptions, however, once acknowledged they are fused with the interpretation of the narrative and vital in the research phenomenon. This study utilized Heideggarian hermeneutics where the goal was to study how people interpret their lives and make meaning of what they experience (Cohen *et al*, 2000). Unlike the Husserlian branch of phenomenology, Heideggarian philosophy accepts that the data generated by the participant is fused with the experience of the researcher.

The status of the literature review also reflects this philosophy. It is a common misconception that the researcher should not begin the study with the literature review (Cohen *et al*, 2000). This is linked to the Husserlian view on bracketing, attempting to prevent contamination of the analysis by the researcher. Within the Heideggarian approach, the role of the researcher and importantly their knowledge and experience, are accounted for. In addition, the research question should arise from a personal or professional question about the phenomena and/or develop from previous research in order to fill gaps in knowledge (Bale *et al*, 2003).

This study adopted this philosophy as it was appropriate and was particularly important since the best available evidence suggests that women find TENS effective, particularly in view of its non-invasive nature. However, no evidence is apparently available that highlights why they feel this way. The study seeks to find out how women perceive TENS, what is important to them and why. In order to do this a phenomenological approach underpins the design of this study.

The aim of this study therefore was to explore and gain a greater understanding of women's experiences of using TENS for pain control in labour. In order to do this an interpretative phenomenological design was undertaken using semi-structured interviews to generate qualitative data from a group of purposively selected women. This design was built around the principles of Interpretative Phenomenological Analysis (IPA) as described by Smith *et al* (1999) (see below).

3.1.2 Interpretative Phenomenological Analysis (IPA)

3.1.2.1 Introduction

Interpretative phenomenological analysis (IPA) is a relatively recently developed and rapidly growing approach to qualitative inquiry developed by Jonathan Smith in the mid 1990s. It originated and is best known in psychology but is increasingly being used by those working in the human, social and health science disciplines (Smith, 1996; Jarman *et al*, 1997; Smith, 1999; Dibsdall *et al*, 2002; Chapman and Smith, 2002; Bale *et al*, 2003; Fade, 2004; Doherty and Doherty, 2005).

According to Smith *et al* (2009) IPA is a qualitative research approach committed to the examination of how people make sense of their major life experiences. IPA is phenomenological in that it is concerned with exploring experience in its own terms and hence a good fit within the overarching design of this study. The term 'experience' is a complex concept. IPA researchers are especially interested in what happens when the everyday flow of lived experience takes on a particular significance for people. This usually occurs when something important has happened in our lives. When people are engaged with 'an experience' of something major in their lives, they begin to reflect on the significance of what is happening and IPA research aims to engage with these reflections. These experiences are of major significance to the person, who will then engage in a considerable amount of reflecting, thinking and feeling as they work through what it means to them. The experience of using TENS for pain control in such a major event as in childbirth has been reflected on by the women in this study, who have been able to interpret their thoughts and feelings.

The research participant in an IPA study attempts to make sense of what is happening to them by interpretation which is informed by hermeneutics, the theory of interpretation. IPA shares the view that human beings are sense making creatures, and therefore the

accounts which participants provide will reflect their attempts to make sense of their experience. IPA recognises that access to experience is always dependent on what the participant tells us about that experience, and that the researcher then needs to interpret that account from the participant in order to understand their experience.

The IPA researcher is therefore engaged in a double hermeneutic because the researcher is trying to make sense of the participant trying to make sense of what is happening to them. The researcher's sense making is therefore second order in that he/she only has access to the participant's experience through the participant's own account of it (Smith *et al*, 2009).

IPA is committed to the detailed examination of the particular case. IPA is 'idiographic' in that it wants to know in detail what the experience for *this* person is like and what sense *this* particular person is making of what is happening to them. The aim is to reveal something of the experience of each of the individual participants, whilst as part of the study similarities and differences between each case can be explored. It is then often possible to move to more general claims after each participant's experience has been interpreted. In this study the more general claims are of a group of women who have used TENS for pain control in labour. Due to the larger sample of twenty women being used the study will make claims for both the group and the individual.

Data collection is usually in the form of semi-structured interviews where an interview schedule is used flexibly, transcripts of interviews are analysed case by case through a systematic, qualitative analysis. Analysis of transcripts involves identification of themes that recur and that make sense together but always in a concisely reflexive manner (Coolican, 2004). This is then turned into a narrative account where the researcher's analytic interpretation is presented in detail and is supported with verbatim extracts from the participants.

IPA is phenomenological in that it wishes to explore an individual's personal perception or account of an event or state as opposed to attempting to produce an objective record of the event or state itself. At the same time, while trying to get close to the participant's world, IPA considers that one cannot do this directly or completely. Access is dependant on the researcher's own conceptions which are required to make sense of that other personal world through a process of interpretative activity.

3.1.2.2 Theoretical foundations of IPA

IPA has been informed by concepts and debates from three key areas of the philosophy of knowledge: phenomenology, hermeneutics and idiography, which will be discussed within the following section.

3.1.2.2.1 Phenomenology

Phenomenology is a philosophical approach to the study of experience. As Smith *et al* (2009) highlighted phenomenologists share a particular interest in thinking about what the experience of being human is *like*, especially in terms of the things which matter to us and which constitute our lived world. One key value of phenomenological philosophy is that it provides us with a rich source of ideas about how to examine and comprehend lived experience.

According to Smith *et al* (2009) the key areas for IPA researchers to take from Heidegger at this stage are firstly that human beings can be conceived as 'thrown into' a world of objects, relationships, and language; secondly, that our being-in-the-world is always perspectival, always temporal, and always 'in-relation-to' something and consequently, that the interpretation of people's meaning-making activities is central to phenomenological inquiry in psychology.

In IPA research, our attempts to understand other people's relationship to the world are necessarily interpretative and will focus upon their attempts to make meanings out of their activities and to the things happening to them. It is now therefore appropriate to consider and discuss hermeneutics which focuses on the matter of interpretation itself. Heidegger (1927/1962) in *Being and Time* viewed phenomenology through a hermeneutic lens, a crucial feature of this work.

3.1.2.2.2 Hermeneutics

IPA is underpinned by hermeneutics which is the theory of interpretation and was originally used to interpret biblical texts. Hermeneutics then became used in a wider range of texts such as historical documents and literary works. Hermeneutics and phenomenology were combined by Heidegger, a hermeneutic phenomenologist who was

interested in the context of a text's production and its interpretation, for example its relevance in life in the present day. Heidegger suggested that access to lived time and engagement with the world are always through interpretation (Smith *et al*, 2009).

Heidegger (1927/1962) observed that the word phenomenology is made up of two parts, derived from the Greek *phenomenon* and *logos*. Phenomenon can be translated as 'show' or 'appear'. To appear suggests that it is entering a new state as it is coming forth, presenting itself to us – in contrast to a previous state, where it was not present.

Phenomenology therefore is a discipline which is concerned with understanding the thing as it shows itself, and it is brought to light. Logos can be variously translated as discourse, reason and judgement. While *phenomenon* is primarily perceptual, *logos* is primarily analytical, and this is useful to illuminate the complementary activities which are involved in phenomenology. The primary aim, according to Smith (2007) is to examine 'the thing itself' as it appears to show itself to us. Even though Heidegger suggests that this will happen almost spontaneously, the analytical thinking required by the logos aspect then helps us to facilitate, and grasp, this showing. So then the phenomenon appears and the phenomenologist can facilitate this and make sense of it. It is this micro-analysis and synthesis which take Heidegger down the road of defining phenomenology as hermeneutic. As Moran (2000) stated:

'Phenomenology is seeking after a meaning which is perhaps hidden by the entity's mode of appearing. In that case the proper model for seeking meaning is the interpretation of a text and for this reason Heidegger links phenomenology with hermeneutics. How things appear or are covered up must be explicitly studied. The things themselves always present themselves in a manner which is at the same time self-concealing'

Moran (2000:229).

In the later part of *Being and Time*, Heidegger discussed interpretation explicitly, this section sets Heidegger in opposition to Husserl-

'Whenever something is interpreted as something, the interpretation will be founded essentially upon the fore-conception. An interpretation is never a pre-suppositionless apprehending of something presented to us'

Heidegger, (1962/1927:191-192).

Thus the reader, analyst or listener brings their fore-conception (prior experiences, assumptions, preconceptions) to the encounter, and cannot help but look at any new situation in their light of their own prior experience. Heidegger goes on to say-

‘Our first, last, and constant task in interpreting is never to allow our ... fore-conception to be presented to us by fancies and popular conceptions, but rather to make the scientific theme secure by working out the fore-structures in terms of the things themselves’ (Heidegger, 1962/1927:195).

Having engaged with the text the researcher will be in a better position to know what the preconceptions were, be reflexive and as Smith (2007) suggested rather than putting one’s own preconceptions up front before doing interpretation, one may only really get to know what the preconceptions are once the interpretation is underway.

Heidegger firstly therefore formulates phenomenology as an explicitly interpretative activity and the connection he makes to hermeneutics are clearly important – IPA is an interpretative phenomenological approach. Secondly Heidegger unpacks the relationship between interpretative work and the fore-structure of our understanding causing us to re-evaluate the role of bracketing in the interpretation of qualitative data. Bracketing therefore is a cyclical process and something which can only partially be achieved.

3.1.2.2.3 The Hermeneutic Circle

The hermeneutic circle is perhaps the most resonant idea in hermeneutic theory and is picked up by most hermeneutic writers. It is concerned with the dynamic relationship between the part and the whole, at a series of levels. In order to understand any given part, you look to the whole, to understand the whole, you look to the parts. In analytical terms it describes the processes of interpretation very effectively and lends itself to a dynamic, non-linear, style of thinking.

The meaning of the word only becomes clear when seen in the context of the whole sentence. Similarly, the whole sentence depends on the cumulative meanings of the individual words. The reader’s history is changed by every encounter with a new piece of text. According to Smith (2007) the hermeneutic circle provides a useful way of thinking about ‘method’ for IPA researchers the process being iterative and moving back and forth through different ways of thinking about the data, rather than completing a step-by step

approach. The idea is that our entry into the meaning of the text can be made at a number of levels, all of which relate to each other.

According to Cohen *et al* (2000) the researcher begins with a vague and tentative notion of the meaning of the whole of the data and with the reflexive awareness that this notion is an anticipation of meaning. This awareness causes a dialectical examination of parts of the data to understand better the whole. With a better understanding of the whole, examination of different data or the same parts of the data at a deeper level drives the analysis ahead. An understanding of the hermeneutic circle requires the researcher to consider the meanings of the smallest units of data in terms of ever-increasing larger units of data and vice versa. The hermeneutic circle metaphor also leads the researcher's analysis outside the context of the individual interview as well as the context of the individual participant. Using the hermeneutic circle as a means of interpreting data means that the smallest statements must be understood in terms of the largest cultural contexts. This also means that all the contexts in between must be taken into consideration; the person, the family, and the community must be considered.

Hermeneutic phenomenological researchers document more rigorous steps of interpretive understanding as they attempt to incorporate a portion of the participant's horizon of experience into their own. The tentative understandings of the data that emerge from initial analysis should be subjected to scrutiny as more data are collected. This in turn leads to further refinement of these understandings, which will again be scrutinised in light of new data. The tentative understandings should always be written down and these writings serve not only as a record of the analytic process, but also as Van Manen (1994) has described it, the act of writing itself forms the research process in hermeneutic phenomenology.

Blattner (2006) wrote that circularity is not necessarily a problem, because ontology proceeds hermeneutically and hermeneutics is essentially circular in method. Blattner (2006:22) quoted the work of Heidegger who wrote 'What is decisive is not to get out of the circle but to come into it in the right way'. Just as in reading a book we move back and forth between an understanding of the part of the book that we are reading and our understanding of the whole book. Heidegger's phenomenological approach to the self focuses first on a basic form of self-disclosure: I am what matters to me. Seen thus, I cannot disentangle myself from those around me and the world in which I live (Blattner 2006:41) – this supports not being able to suspend or bracket off my preconceptions,

however they can be acknowledged and documented (see reflexivity in section 3.2.5.1 and reflective rationale in Appendix 4).

Hermeneutics is an important part of intellectual history and offers important theoretical insights for IPA. IPA is an interpretative phenomenological approach and therefore Heidegger's ascription of phenomenology as a hermeneutic enterprise is significant. IPA is also concerned with the examination of how a phenomenon appears and the analyst or researcher therefore has the task of facilitating and making sense of the appearance.

3.1.2.2.4 Idiography

The third major influence on IPA is idiography. This is concerned with the particular and operates at two levels. Firstly, there is a commitment to the particular in the sense of detail, and therefore depth of analysis. As a consequence analysis must be thorough and systematic. Secondly, IPA is committed to understanding how particular experiential phenomena (an event, process or relationship) have been understood from the perspective of particular people, in a particular context. The exploration of each personal perspective starts with a detailed examination of each case before moving on to more general claims. IPA therefore uses small, purposive carefully situated samples (Smith *et al*, 2009).

3.1.2.3 The key elements of IPA

Reid *et al* (2005) identified the following key elements of IPA which are consistent with my study.

- IPA is an inductive approach (it is 'bottom up' rather than 'top down'). It does not test hypotheses, and prior assumptions are avoided. IPA aims to capture and explore the meanings that participants assign to their experiences.
- Participants are experts on their own experiences and can offer researchers an understanding of their thoughts, commitments and feelings through telling their own stories, in their own words, and in as much detail as possible. Participants are recruited because of their expertise in the phenomenon being explored.

- Researchers reduce the complexity of experiential data through rigorous and systematic analysis. Analysis relies on the process of people making sense of the world and their experiences, firstly for the participant, and secondly for the analyst.
- Analyses usually maintain some level of focus on what is distinct (idiographic study of persons), but will also attempt to balance this against an account of what is shared (commonalities across a group of participants).
- A successful analysis is:
 - Interpretative (and thus subjective) so the results are not given the status of facts
 - Transparent (grounded in example from the data)
 - Plausible (to participants, co-analysts, supervisors, and general readers).
- Researchers should reflect upon their role in the interpretative and collaborative nature of the IPA interview, data analysis and subsequent publication.

Having discussed the design of the study, I will now move onto the second section of this Chapter and detail the data collection process for the study.

3.2 Data collection

Data collection was through semi-structured interviews and was collected over a five month period, from January until June, 2007. The interview transcription process commenced during the data collection period and extended for a further five months (ten months in total). During this time, the researcher also returned to the participants with the transcripts and the ‘preliminary themes’ that had emerged from the data, for clarification, verification and alteration where needed. There was an overlap of data collection, the transcribing process, extraction of preliminary themes and returning to the participants. An accurate diary was kept of the whole research process at this stage.

3.2.1 Sampling strategy

3.2.1.1 The type of sampling

Morse and Field (1996) suggested that random sampling is inappropriate in qualitative research and emphasize the importance of collecting rich experiential data. As the focus in phenomenological research is on individual meanings, the researcher has to identify a sample of people who will be able to participate because they have personal experience of the phenomenon under study. Gibbins and Thomson (2001) stated that phenomenology uses non-probability sampling procedures, where participants are included because they have ‘a certain’ knowledge of the phenomena, therefore the term ‘purposive’ sampling is used. Patton (1990) also supported this and suggested that purposive sampling permits selection of interviewees whose qualities or experiences permit an understanding of the phenomenon in question and are therefore invaluable. Purposive sampling was therefore used in this study.

3.2.1.2 Sample size

Many phenomenological studies necessitate the use of in-depth interviews (Gibbins and Thomson 2001; Lundgren ad Dahlberg 1998; Berg and Dahlberg 1998), the sample size, therefore, needs to be small and selective (Clifford, 1997). Size, does not, however, reflect the amount of data available or the depth of investigation that is possible. Other studies relating to midwifery, using a phenomenological approach and supporting small sample sizes are Halldorsdottir and Karlsdottir (1996), Lundgren and Dahlberg (2002) and Beck (1994). The sample size for this study had intended to be a maximum of twenty women, which was adhered to along with a ‘practice interview’.

Reid *et al* (2005) advocated that IPA challenges the traditional linear relationship between ‘number of participants’ and value of research. Reid *et al* (2005) looked at the IPA literature base collectively and the mean number of participants involved in an IPA research to date is fifteen. The largest sample involved semi-structured interviews with forty two participants. Conversely case studies were employed for three pieces of research. Larger samples however, can be used to explore one phenomenon from multiple perspectives and can help the IPA analyst to develop a more detailed and multifaceted account of that phenomenon. This research study has a sample size of twenty participants and was chosen with the desire for a mixed sample of different participants to be obtained,

this number was the average number in phenomenological studies accessed and was considered to be a large sample in IPA research, allowing for both an idiographic focus and the possibility of making claims for the larger group of study participants. The large sample was analysed and presented in accordance with Smith *et al's* (2009) recommendations of how to proceed with larger samples.

I was a community midwife and had my own caseload of women. For the purpose of this study, it was decided that the women in the study (the sample) would not be known to me (my own caseload) in order to prevent bias. The inclusion and exclusion criteria for the study are shown in the tables below.

Table 3.1 The 'Inclusion criteria' for women entered into the study

- Women aged 16 years and over.
- Women that have the ability to consent for themselves.
- Women 37 weeks gestation and over.
- 'Low-risk' of complications.
- Women that may have used other forms of supportive therapies, namely - water, massage, reflexology, in labour.
- Women that may have used entonox as analgesia.
- Women who have delivered in hospital or at home.
- TENS was used for a minimum of an hour during their labour.
- Women who can be interviewed in English.

Table 3.2 The 'Exclusion criteria' for women not eligible to be in the study

- Women under the age of 16 years old.
- Women less than 37 weeks gestation
- 'High-risk' pregnancy and birth.
- Women that have had complicated deliveries.
- Women that have had pethidine or an epidural in labour.

3.2.2 The interview process

The semi-structured interviews took place in the participants' own homes, for their convenience, having recently had a baby. Berg (1998) identified the "ten commandments" of interviewing, which were followed by the researcher and are shown in Appendix 5. The 'lone working' policy follows the University guidelines and was adhered to. Another

venue, namely a room, within the health centre was available, if the participants preferred. However, it was not needed.

The interviews took place between day 14 – 28 in the post-natal period. It was felt appropriate to visit after the first ten days when the community midwife would be visiting, as the woman may have felt under pressure to give the right answers or say the right thing. The semi-structured interviews were conducted face-to-face and myself and the participant were the only people present apart from the new baby. All attempts were made not to have other children or partners present. The reason for this is that interruptions would not assist in the interview. However, if this could not be avoided, it was accepted and recorded. The ‘participant interview topic guide’ (Appendix 6) was used to guide each interview.

The interviews were tape recorded with the aid of a microphone. Two tape recorders were used, in order to ensure that if a problem occurred with the tape recorder, then the other machine would record the data. It was also useful having two copies of the tapes, due to the sound being better on one or the other in certain situations. On one occasion the tape did not pick up some of the conversation of an interview, the second tape fortunately had recorded the conversation. The interviews were expected to last from forty-five minutes to one hour, however, the interviewer/researcher was prepared that the interview may come to ‘a natural end’ or that if the information was still ‘freely flowing’, then it would take longer. The interviews actually lasted from twenty-five minutes to almost two hours. I allowed each woman to ‘take us on her journey’ through labour and her experiences associated with this. I was aware that the ability to establish a good rapport with the participant was paramount, and that the research ‘tool’ was not only the interview itself, I was a research instrument, consistent with an IPA study (Smith *et al*, 1999). Note taking equipment was also needed to record the environment, the situation, and any points of note. Demographics, such as age and other details were recorded before or after the interview, whichever suited the participant. I noted any feelings and/or important points about each interview and the participant on returning home. This was important and a crucial part of the analysis and interpretation process. Cohen *et al* (2000) suggested that analysis begins with data collection and the researcher cannot help but begin reading the text and hence analysing and interpreting its meaning.

An interview process guide enabled the focused orientation towards the phenomenon of interest, which is the essential objective of the hermeneutic interview (Table 3.3).

Table 3.3 Interview Process Guide

Aspect of Interview	Technique
Initial warm-up	Establish initial rapport with participant Clarify the interview purpose
Initiation of interview	Ask opening question: "Please can you tell me about your experience of labour?"
Maintaining focus	Encourage description rather than analysis If TENS not mentioned spontaneously, prompt used: "Tell me about your experience of using TENS during labour" Ask 'how?' rather than 'why?' questions
Maintaining purpose	Focus on participant's experience Allow silences for reflective thought Refrain from the use of 'leading' questions Clarification of any points or ambiguities
Maintaining rapport	Confirm importance of participant's contribution Appropriate non-verbal responses to confirm interest Respectful at all times Attentive listening
Interview closure	Give assurance that the information has been valuable Establish whether participant has anymore to contribute Confirm that no more information is required at present
De-briefing	Thank participant Reiterate closure Answer any further questions about the research Remind participant about contact numbers for further information/support Reminder of return visit with transcript and preliminary themes for accuracy, confirmation (or alteration)

3.2.3 The transcription process

I transcribed the data myself, Robinson (2000) supports this by saying that personally transcribing the recordings, however slow the process, permits familiarity to grow and allows the researcher to become further immersed in the data, even though this proved difficult at times, due to time constraints. Each participant was allocated a number, allowing their names to be removed. The transcripts were given the matching number. All other names of partners, children, places, hospitals and TENS hiring companies were also removed in order to preserve anonymity and confidentiality. The interviews were transcribed verbatim. Having two recordings of each interview proved helpful to clarify areas of the tape which were unclear. Notes were made on the interview transcripts, for areas, or words that needed clarification. The tapes and transcripts were always kept securely.

The 'Preliminary themes' were identified by reading and re-reading the transcripts and listening to the tapes, then by making notes on the transcript and developing themes from these. The Table (3.4) shown below, is an example of the preliminary themes that were identified within transcription 15. Some examples of the preliminary themes from the text are shown verbatim along with comments where appropriate.

It is important to note here that examples from Participant 15 have been used throughout the thesis to provide consistency. Participant 15 was chosen because her experience was comparable to the other participants. She had a home birth and had used TENS twice. Most of the preliminary themes that were found across the cases were present in her account of the experience. Participant 15's textual account is therefore a good representation of the other participants.

Table 3.4 Preliminary Themes from Transcription 15

Preliminary Themes	Notes/Transcript
Knowledge and application of TENS	The participant used TENS for both of her labours and put TENS on straight away when in labour. She practiced before labour and checked that the batteries were working. She had knowledge about endorphin production if TENS was applied early 'I had heard something about endorphins coming if you use TENS quite early on'. She applied the TENS herself and it was checked by the midwife. TENS was talked about at yoga and active birth classes. The midwife had talked about TENS with the first pregnancy. She had previously seen TENS work with people with chronic pain and 'knew TENS kind of made sense'.
Involvement of Partner	The partner was shown where to put the TENS pads and was supportive with the use of TENS. The partner also participated by writing down the contraction times. There was an interaction between the participant and her partner with the use of TENS.
Combination of Natural Pain Relief	TENS was used with other natural methods of pain relief, for example yoga, breathing, moving, dancing and later water was used after the TENS was removed. 'Just using yoga and TENS'.
Distraction of the TENS	TENS was really helpful, particularly the 'booster button', 'when you press the button it goes sort of solid through a contraction'. 'You could really tell the difference, at the same time doing the yoga breathing stuff, the two things were so distracting from the discomfort'. 'The TENS was masking the pain-as soon as the TENS came off, I thought 'oh no', that actually really hurts'. 'Its just about distracting yourself and taking your mind off it'. 'I think that there is a suggestible element to TENS'. 'It kind of took my mind off what was going on at the front and helped the pain as well, so that was great, it was working in two ways in the end'.
Physical Sensation	When you press the button it goes 'sort of solid' through a contraction. The TENS machine was helpful for a false labour/painful night before labour started. 'It felt tingly really it was quite pleasant once you had got used to it'. 'If it was too high it would give me little jumps like an electric shock'. 'If the TENS was up to high, it started getting uncomfortable with the tingling'.
Versatility of TENS Application/Removal	TENS was removed to enter the water birth pool, however the pool was entered too early, therefore participant got out and re-applied the TENS machine. It can be applied as soon as labour starts.
Mobility During Labour	The participant went for a walk when in labour with the TENS on. 'I enjoyed my labour as I just danced and jiggled round the house, it was really helpful with the booster button, it was a bit more active this time'. 'It was really important to be moving around for me, just standing up, keeping upright, just makes sense, doesn't it with gravity sort of thing'.
Being 'In Control'	'I felt really, really safe'. 'I was trying to concentrate on the contractions'. 'I felt like I'd done it all myself, it was really nice'. 'It actually makes you feel like you're in control of what's going on'. 'I pressed the button and it really felt like I was taking charge of what was going on which was really helpful'. 'I just wanted to be in charge of it completely'.
Wanting a Drug Free labour	'I had wanted to have a drug free home birth and this kind of thing so I deliberately hadn't got pethidine'.
Faith in TENS	'I had a lot of faith anyway that TENS would work for me'. 'I have never had any concerns about the TENS working I knew it would work in my head'. 'I was absolutely convinced that the TENS would work'. 'I would definitely use it again and recommend it to friends'.
Midwife Support with TENS in labour	The midwife offered support with practical application-'I got her to adjust the pads for me'. The midwives had talked about TENS at the antenatal classes and supported the use of TENS in labour.

3.2.4 Returning to the Participants with the Transcript and Preliminary Themes

Returning to the participants was an important part of this research study. This stage followed data collection, transcription of the interviews and development of the preliminary themes and has shown to be a supportive and a vital part of the analysis process for this study. Colaizzi (1978) advocated this as a way of supporting credibility issues and for validation of results. Similarly, Cohen *et al* (2000) described this as a way of strengthening the analysis and of reducing bias, themes can be verified with the informants to ensure that the themes appropriately capture the meaning that the informant sought to convey.

Each participant was contacted and a convenient date and time was arranged for the return visit. A discussion took place with each participant to verify the ‘preliminary themes’ and alter or clarify any part of the text that was necessary. Part of the text was removed if the participant asked for this to be done (this only happened twice). All names in the text, partners, for example had been removed to preserve anonymity, emphasised words or phrases had been highlighted and pauses had been inserted as per annotation guide (Appendix 7). The participants seemed to enjoy reading the transcripts, and found this experience interesting some weeks after their labour. I was, again welcomed into the participants’ homes. The participants were informed that they would receive a ‘summary’ of the research study, when it has been completed and were thanked again for their time and their contribution to the study.

3.2.5 Trustworthiness of the data

Trustworthiness, the extent to which the findings reflect the reality of the experience of the participants, is an essential component of qualitative research. The trustworthiness of the findings generated in this study have been checked in a variety of ways:

- The credibility of the interpretation of the data made by the researcher has been checked with participants (member checking) on an ongoing basis. This occurred in a number of ways 1) as data have been collected clarification of points raised or ambiguities have been made 2) after data have been collected by a) taking back the transcript to each participant for checking for accuracy and b) returning a summary of the themes generated by that participant for confirmation (or alteration). This was strictly adhered to and the transcript and preliminary themes were taken back

to every participant by the researcher, in order to preserve credibility and guard against researcher bias (Robson, 2002).

- The dependability of the data has been checked using the researcher's second supervisor. This supervisor has analysed a number of transcripts and the emergent themes that are generated by the researcher and the second supervisor have been compared for consistency.
- The researcher's approach to interviewing has been reviewed by the research supervisor by auditing a number of audio-tapes to ensure that an objective and neutral approach was used.
- The researcher has kept an audit trail for this research study (Appendix 8), which is a systematic collection of documentation that allows an independent auditor to come to conclusions about the data and the processes through which it was collected and analysed.

Lincoln and Guba (1985) suggested that providing an 'audit trail', makes explicit each step of the research process. In order to ensure a qualitative study's dependability, another researcher would need to travel the same pathway, resulting in similar findings (Talbot 1995).

A reflexive rationale or account has been included in Appendix 4, which identifies personal preconceptions, thoughts and feelings relating to the research study at each stage and explains in more depth the changes or decisions that were made over time. Reflexivity and the importance of it in the current study are described below.

3.2.5.1 Reflexivity

Reflexivity is a process of self examination (DePoy and Gitlin, 1998) which, as described by Parohoo (1997) is the continuous process of reflection by the researcher on her own values, preconceptions, behaviour or presence and those of the respondents, which can affect responses. It was important when undertaking a research project such as the current study that reflexivity was considered, discussed and introduced as an integral part of the study. In the present study reflexivity was facilitated through keeping diaries, notebooks

and supervision notes. These enabled me to consider how my own values, preconceptions and behaviours might be influencing the way the study progressed. A synthesis of the details from the above sources underpinned the reflective rationale presented in Appendix 4 and an audit trail (Appendix 8).

For the understanding of participants' experiences, it is necessary to become familiar with their world. When professionals do research they are often part of the setting they investigate and know it intimately. This might mean that they could miss important issues or considerations or see the setting they are investigating in a biased way. Holloway and Wheeler (2002) suggested that to be able to examine the world of the participant, researchers must not take this world for granted but should question their own assumptions.

Burns and Grove (2005) suggested that qualitative researchers need to critically think through the dynamic interaction between the self and the data occurring during analysis. The critical thinking used to examine this interaction is part of reflexive thought or reflexivity. During this process the researcher explores personal feelings and experiences that may influence the study and integrates this understanding into the study using a conscious awareness of self.

Lavender *et al* (2004:48) stated that 'values reflect the personal beliefs and feelings of the researcher and there is growing recognition that it is not feasible to expect the researcher to hold these feelings in check'. It is therefore inevitable that they will impinge on the research. The researcher is not detached from the knowledge or evidence gathering and therefore needs to reflect on his or her role in the research process and the impact this may have. Lavender *et al* (2004) recommended that a good qualitative researcher will acknowledge that the research cannot be value free, will demonstrate reflexivity and take adequate steps to minimise bias.

Becoming a reflexive researcher seemed to occur naturally. Whilst immersed in the active phase of the research study namely the interviews, I reflected on each interview immediately after and documented feelings and thoughts in order not to forget any important points. As the interviewer I was a 'tool' in the research study and felt that it was important to be neutral and objective. Cluett and Bluff (2000) supported this and advocated that in any qualitative research study the researcher is the research tool and therefore becomes part of the study. The interviews were personally transcribed verbatim

in order to immerse myself in the data: this also allowed discussion and checking with my supervisors.

Being reflexive also required me to consider my position as a researcher in terms of the ‘insider outsider’ research perspectives. An ‘outsider’ research position is ‘a researcher undertaking research into practice with no professional experience’ and the aim of the research is usually to contribute to the body of social science knowledge. An ‘insider’ position is ‘a practitioner undertaking research into their own and their colleagues practice’ and the primary aim of this research position is usually to solve a critical problem or to develop an understanding about the nature of practice, and ultimately to contribute to the body of professional knowledge (Reed and Procter, 1995:10). My position is that of an insider.

Being reflexive is important for the insider researcher since it is impossible to forget years of training and practice as soon as one adopts a research role and these, and other factors, might affect the integrity of the research if unacknowledged. The researcher, as part of the process used in qualitative research, needs to continuously reflect ‘on how their actions, values and preconceptions impact on the research setting and affect the data collection and analysis’ (Gerish and Lacey, 2006:539). Reed and Procter (1995) remind researchers that research decisions including choice of research questions will be based on and maybe biased by prior experience of practice. One advantage of being an insider is given by Broderick (2008) who, working as an insider in her own research, argued that women responded positively to her as a midwife and researcher researching her own field. However, it could also be a disadvantage since women could respond positively to the presence of the insider researcher and say what they think the professional wants to hear. Being reflexive throughout this study has enabled me to consider my decisions and note my rationale for them. An example of my doing this occurred at the early planning phase of the study when I decided to distance myself from my role as a community midwife and not interview the participants until the midwives had stopped visiting them (14 – 28 days after the birth) in order to confirm that I was there as the researcher and not a midwife.

The hermeneutic circles (figures 3.2 and 3.3) have contributed to reflexivity in this study. Figure 3.2 showed that my preconceptions from my experience have been acknowledged and have then been changed with each encounter with the participants. The thorough interpretation and analysis process (figure 3.3) from consideration of single words and sentences to consideration of all the texts within the phenomenon being studied required

continuous reflection on my own values. I have tried to maintain an open and curious mind in order to be receptive to what the text has to say (Johns, 2009). Whilst acknowledging that the texts are deeply subjective and contextual, I also acknowledge that the reader of this study will have his or her own experiences and will therefore make their own interpretations based on what they already know and believe.

Reflexivity was also enhanced through measures undertaken to ensure the trustworthiness of this study (section 3.2.5). This was assured by checking the interpretation of the data with the participants, clarification of points on an ongoing basis and by checking the transcripts with participants for accuracy, confirmation or alteration if necessary. My second supervisor analysed a number of transcripts and the emergent themes and they were compared for consistency. Validation also occurred by my main supervisor reviewing my interview technique and checking that I was using a neutral and objective approach. I discussed my experience, feelings and values with my supervisors and made every attempt to reflect on myself and my part in the current study throughout the research process. I have acknowledged my position as an insider researcher and as a practising midwife and that my experience and background has had an impact on the research process. I have therefore been reflexive, have taken steps to reduce bias, acknowledge my preconceptions and have examined my own feelings, beliefs and values.

An audit trail (Appendix 8) and a reflective rationale (Appendix 4) were kept in order to support reflexivity.

3.2.6 Ethics

The conduct of research requires not only expertise and diligence but also honesty and integrity. Conducting research ethically starts with the identification of the study topic and continues through to the publication of the study. Ethical research is essential in order to generate sound knowledge for practice. According to Burns and Grove (2005), ethical codes and regulations have been developed to provide guidelines for (1) the selection of the study purpose, design, methods of measurement, and subjects; (2) the collection and analysis of data; (3) the interpretation of results; and (4) the presentation and publication of the study. Burns and Grove (2005) stated that conducting research ethically requires protection of the human rights of subjects, namely, self-determination, privacy, anonymity and confidentiality, fair treatment, and protection from discomfort and harm. The rights of

research subjects can be protected by balancing benefits and risks of a study, securing informed consent, and submitting the research for institutional review.

As a midwife and ‘researcher’, I am fully aware that protection of confidential information is vital. The NMC (2008) emphasises how important it is to treat information about patients and clients as confidential and use it only for the purposes for which it was given. This applies to research studies and information as well as when caring for the patient. The NMC (2004) code says that as a midwife you are personally accountable and that you must respect the patient or client as an individual, obtain consent before any care or treatment, be trustworthy and act to identify and minimise risk to patients and clients. I have a duty to the trust/site that approved the research study, the respondents, and the University. Ethical procedures were therefore respected and strictly followed throughout my research study and are detailed below.

3.2.6.1 Ethical considerations

The following ethical procedures have been carried out to gain approval for the study.

1. Approval from the local ethics committee (COREC) was granted on 1st December, 2006. (Appendix 9)
2. Application to the NHS Research Site, R & D department. The research project complied with data protection principles. (Appendix 9)
3. The University of Southampton agreed to act as the sponsor of the research project and provided professional indemnity insurance. (Appendix 9)
4. Permission was gained in writing, from the ‘Head of Midwifery’ at the Research site.

3.2.6.2 Informed consent

All participants were provided with a letter inviting them to take part in the study (Appendix 10) and an information sheet about the study (Appendix 11). Once they had read the information sheet the researcher discussed the study and answered any further questions. When satisfied, the participant was asked to complete the consent form

(Appendix 12), which was signed and a copy has been kept by myself, and second copy has been kept by the participant.

All participants were asked if they agreed to the audio-taping of the interviews within their consent process. They were reminded at the beginning of the interview and consent was again confirmed for audio-taping. Tapes have been kept securely until after examination and results of the thesis are finalised. As part of the informed consent procedure, all participants were reminded that they may withdraw from the study at any stage without giving a reason. Participants were also reminded that withdrawing or deciding not to take part, would in no way affect the care that they received from any health professional.

3.2.6.3 Right to privacy of information

All participants in the study were informed that any information that they have provided will be kept strictly confidential in that it is anonymous. No names or material easily leading to identification have been used. Each participant has been given a ‘participant number’ and their identity is only known to the researcher. Data has been and will continue to be stored in a locked filing cabinet, locked unattended offices are security protected and the computer that is being used, is password protected (in accordance with the Data Protection Act 1998).

The researcher handled the data personally. The supervisor from ‘The Faculty of Health Sciences’, University of Southampton’, also had access to their tapes and transcripts to ensure trustworthiness. Data protection procedures for the University and the NHS Research site were strictly followed.

3.2.6.4 Avoidance of harm/distress

It is not expected that any participant would risk harm in taking part in the study. However, the participants were encouraged to talk about any issues arising from the interviews, with myself or my research supervisor. At any stage, the participant was free to withdraw from the study, without having to state a reason or their care being affected. The researcher has removed herself from her usual role as a midwife and any participants who felt that they had issues would have been referred on to the appropriate professional,

depending on the issue, for example the GP, midwife or health visitor. Fortunately, this did not happen and no participants withdrew from the study.

3.2.7 Recruitment process

In order to gain access to the sample I -

- Gained approval from the Head of Midwifery at the midwifery unit/hospital where the research study took place.
- Visited the hospital midwives to inform them of the research study and to gain their interest/support in the study. The three community teams were visited, during their meeting times, on several occasions, with the aim of the information reaching as many midwives as possible.

3.2.7.1 The sample of women were recruited by hospital and community Midwives

Hospital and Community midwives identified the women who had used TENS and fitted the ‘inclusion criteria’ (Table 3.1). I did not approach the women. The midwives were given a full explanation of the recruitment process and were given the ‘information packs’ (see section 3.2.7.2).

3.2.7.2 The ‘information pack’

The ‘information pack’ could have been given to the women in hospital or in the woman’s home, the latter most commonly occurred. The pack contained:-

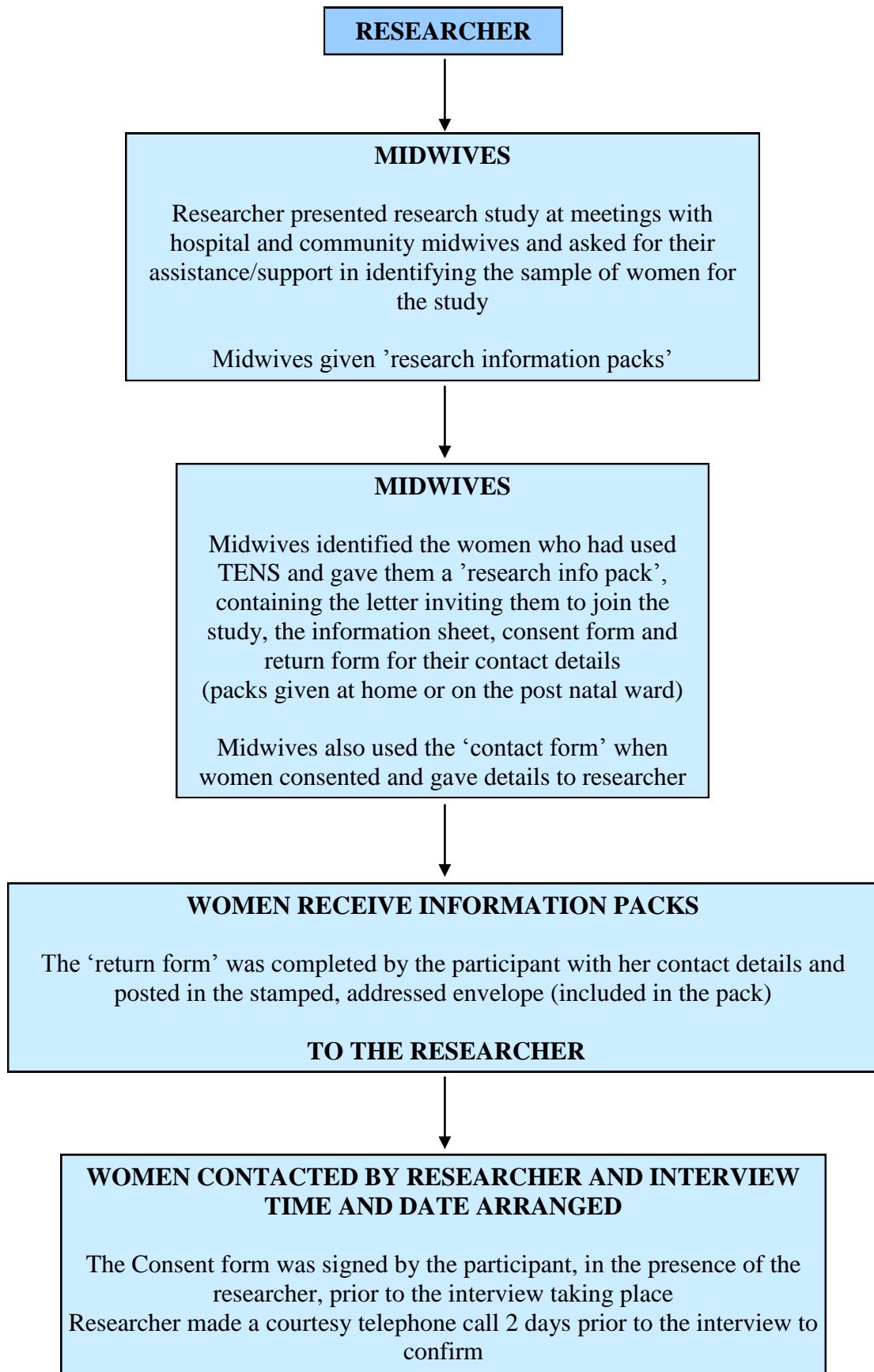
1. A ‘letter’ – Appendix 10, inviting the women to join the study. This letter stated clearly the right to refuse or withdraw from the study at any time and assured confidentiality. Clifford (1997) suggested that in ethical terms a letter is less intrusive than approaching women and asking them face-to-face.

2. A ‘**participant information sheet**’ (**PIS**) – Appendix 11, accompanied the letter, explained the purpose of the study, what their participation involved and invited them to take part.
3. A ‘**participant interview consent form**’ – Appendix 12, was included and was signed by the participant, in my presence, before the interview took place (two copies were signed, one for myself and one for the woman). My copy has been kept securely.
4. A ‘**return form**’ - Was also included for the participant’s contact details, which they could have posted in the stamped, addressed envelope provided. This was not used, however it was an option if needed.

Alternatively, midwives were able to pass the details of the women that were interested in taking part in the study, to me via the ‘contact form’. This was the way all of the sample of women were obtained and was the most efficient way for to obtain the details and therefore the women’s consent for me to contact them.

I then contacted the participant and a convenient time and place for the interview was arranged. If the participant had not received an ‘information pack’, arrangements to deliver this or post it to the participants were made, prior to the interview being conducted. It was important that the participant had time to read the letter, the participant information sheet and the consent form. A ‘courtesy call’ was made two days prior to the interview date to confirm that it was still convenient. The recruitment process is clearly detailed in the ‘Flow chart’ (Figure 3.1) below.

Figure 3.1 Flow Chart to Show Recruitment Process



3.2.7.3 Testing out the methods of data collection

The interview process and topic guide used in this qualitative research was intended to be non-directive and responsive to individual narratives. The interview technique and topic guide (Appendix 6) was kept under review by the researcher and supervisors and adapted once after the practice interview only. A conventional pilot study was not necessary in this study. However, a ‘practice interview’ (Participant number 1) was carried out in order to check out the ‘participant interview topic guide’ and the interviewing technique used, along with improving the confidence of the researcher. The transcript from this interview has not been included in the study as it was agreed from the outset of the study that this would be used in order to gain interview practice/experience only.

Having discussed the data collection for the study, I now move on to detail the data analysis in the final section of this Chapter.

3.3 Methods for data analysis

The qualitative data obtained in the form of loosely structured, narrative materials, namely verbatim transcripts from the in-depth interviews needed to be analysed in order to interpret the data. The purpose of data analysis is to organise, provide structure to, and elicit meaning from the research data. The goal of the analysis is a thick description that accurately captures and communicates the meaning of the lived experience of the informants being studied. A thick description is one that captures the perspective of the informants in its fullest and richest complexity (Denzin, 1989; Geertz, 1973). The following section details the process of data analysis used.

During this process, the researcher needs to ensure that the data analysis enables the meaning of the phenomenon to be understood, whilst preserving the individuality of each participant’s experience. The meaning of the phenomenon comes gradually and as a result of careful and repeated listening, reading and reflecting. Analysis begins with the data collection, the researcher cannot help but begin reading this text and hence beginning to analyze and interpret its meaning. The process of analysis can be characterised as moving between two metaphors—that of the field text, constructed through the activities of data collection, and that of a narrative text, which according to Cohen *et al* (2000) is meant to convey the researcher’s present understanding and interpretation of the data to all other readers.

As previously stated the process of analysis for this study has been informed by Smith (2004) who has developed Interpretative Phenomenological Analysis as an approach to research that is based on phenomenology and the hermeneutic tradition. The existing literature on analysis in IPA has not prescribed a single ‘method’ for working with the data. Smith *et al* (2009) advocated that there have been many methods chapters and published papers that have been characterized by a healthy flexibility in matters of analytic development. As with other approaches in qualitative psychology, the essence of IPA lies in its analytic focus. The focus of this IPA study directs analytical attention towards the participants’ making sense of their experiences of TENS.

Smith *et al* (2009) acknowledged that doing such analysis is inevitably a complex process that is personal, intuitive, difficult, creative, intense and conceptually demanding for the researcher. The commitment to IPA however stems from the fact that it can often be a uniquely interesting, insightful, and rewarding process. Smith *et al* (2009) stated that there is no clear right or wrong way of conducting this sort of analysis and IPA researchers are encouraged to be innovative in the ways that they approach it.

As a result of this the analysis is characterised by a set of common processes, involving moving from the particular to the shared, and from the descriptive to the interpretative. There are principles of commitment to an understanding of the participant’s point of view, and a psychological focus on personal meaning-making in particular contexts which are applied flexibly, according to the analytic task (Reid *et al*, 2005).

Smith (2007) described this analysis as an iterative and inductive cycle, which proceeds by drawing on the following strategies:

- The close line-by-line analysis of the experiential claims, concerns, and understandings of each participant (Larkin *et al* 2006).
- The identification of the emergent patterns (i.e. themes) within this experiential material, emphasizing both convergence and divergence, commonality and nuance, usually first for single cases and then subsequently across cases.
- The development of a ‘dialogue’ between the researchers, their coded data, and their psychological knowledge, about what it might mean for participants to have

these concerns, in this context (Larkin *et al*, 2006; Smith, 2004) leading it in turn to the development of a more interpretative account.

- The development of a structure, frame or gestalt which illustrates the relationships between themes.
- The organisation of all this material in a format which allows for analysed data to be traced right through the process, from initial comments on the transcript, through initial clustering and thematic development, into the final structures of themes.
- The use of supervision, collaboration, or audit to help test and develop the coherence and plausibility of the interpretation.
- The development of a full narrative, evidenced by a detailed commentary on data extracts, which takes the reader through this interpretation, usually theme-by-theme, and is often supported by some form of visual guide (a simple structure diagram or table).
- Reflection on one's own perceptions, conceptions and processes (Smith 2007).

Smith *et al* (2009) described working with larger samples in IPA research and suggested that inevitably the analysis of each case cannot be so detailed. Keeping in line with these recommendations, in this research study, the emphasis shifts more to assessing what the key emergent themes for the whole group are.

Smith *et al* (2009) support the process of this research study in the way that emergent themes have been identified at case level but searching for patterns and connections has been delayed until examining all the cases together. This has allowed the possibility for a great variety in terms of detail of the particular analysis and the relative weighting to group and individual. However, even though the analysis is at the group level, what makes the IPA analysis is the fact that the group level themes will still be illustrated with particular examples taken from individuals (Chapter 4).

It is important here to acknowledge that the primary concern of IPA analysis is the meaning which the participant makes of the experience, however, it is an account of how the analyst thinks that the participant is thinking – this is the double hermeneutic that has

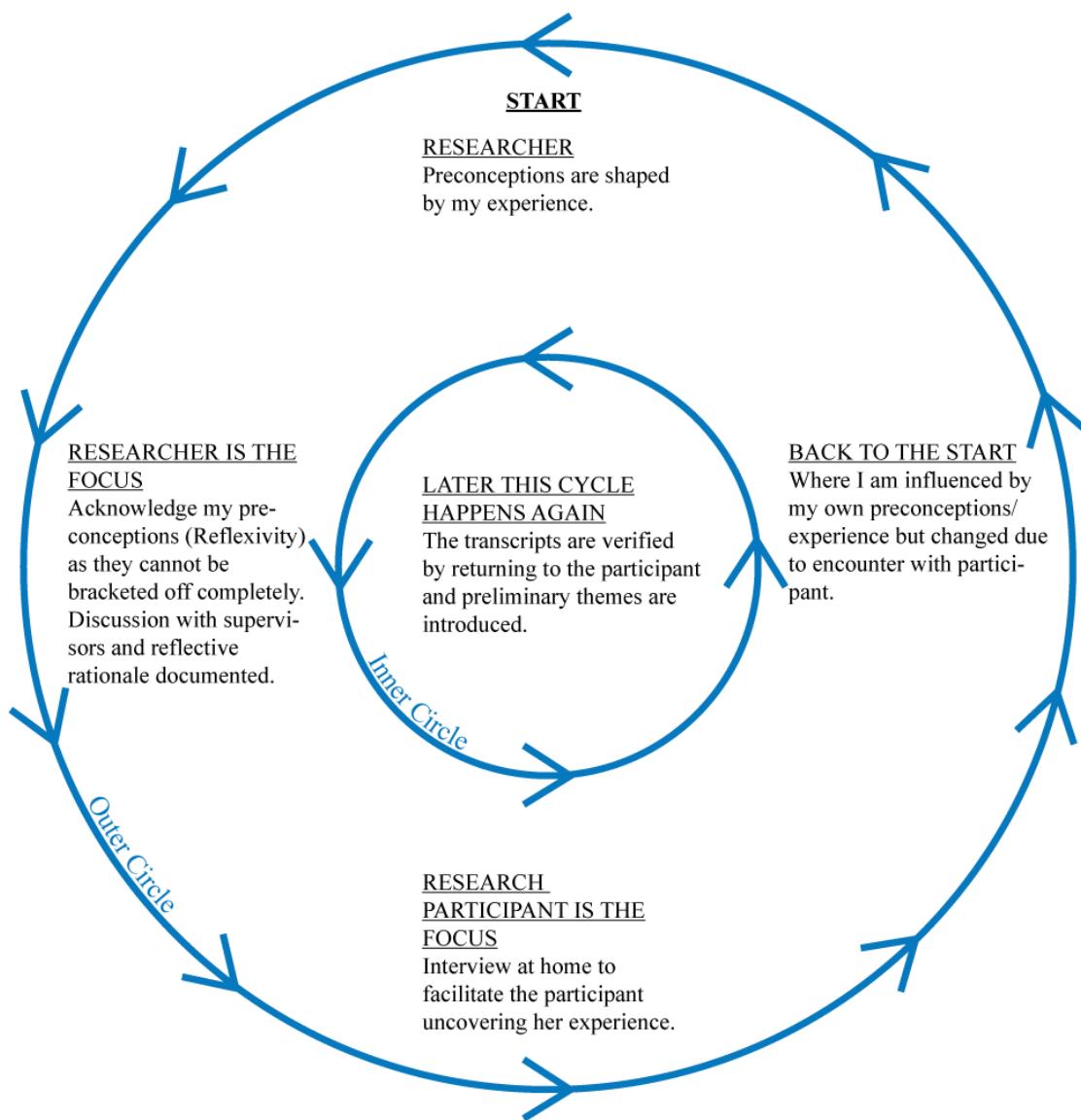
been previously described (section 3.1.2.1). Analysis is therefore tentative and subjective and needs to be dialogical, systematic and rigorous in its application and presentation of the results for the reader. The analysis in IPA is an iterative process of fluid description and engagement with the transcript. It involves flexible thinking, processes of reduction, expansion, revision, creativity and innovation. As such, analysis is open to change and it is only ‘fixed’ through the act of writing up.

For the purpose of this study I developed two hermeneutic circles to assist in the complex analytical process. The first hermeneutic circle (Figure 3.2) identifies an important element of the analysis namely ‘the dynamic between the researcher and the participant’ this is where analysis begins and is fused with data collection. The outer circle represents the process of contact for the interview between the researcher and the participant. The inner circle represents the later contact between the researcher and the participant when the researcher returns to the participants with the typed transcript and preliminary themes to verify and alter the text if required. The second hermeneutic circle, ‘interpretation and analysis: part and whole’ (Figure 3.3) will be discussed in step 2, the deconstruction of the analysis.

3.3.1 The Hermeneutic circle: the dynamic between the researcher and the participant

The first of the hermeneutic circles used in the study was that between the researcher and the participant (the object of interpretation).

Figure 3.2 The Hermeneutic Circle: The dynamic between the Researcher and the Participant



I had already made the decision to enter the hermeneutic circle before the interview had been carried out due to an interest in the phenomena and because of a gap in the research literature on TENS. I start at one point on the outer circle, caught up in my concerns, influenced by my preconceptions, shaped by my experience and expertise. In moving from this position, I acknowledge my preconceptions (see reflective rationale in Appendix 4) before I go round to an encounter with the research participant at the other side of the circle. Whatever my previous concerns or position, I have moved from a point where I am the focus (exploring the literature on TENS and seeking additional knowledge about TENS) to one where the participant is the focus as I attend closely to the participant's story and facilitate the participant uncovering her experience. This requires an intense attentiveness to and engagement with the participant as she speaks. This is a simplified version of what is a complex dynamic process.

The interview process guide (Table 3.3) was used to maintain a clear focus on the encounter with each of the study participants. Having concluded the conversation, I continue the journey round the circle back to where I started. I return home to analyse the material I have collected from the perspective I started from, influenced by my prior conceptions and experience. However, I am also irretrievably changed because of the encounter with something new, my participant and her account. The analysis and interpretation had already started with the first meeting with the participant.

Later, once the interview text had been personally transcribed verbatim and the preliminary themes from the first layer analysis had been documented (see section 3.2, Table 3.4), I move to the inner circle (Figure 3.2-inner circle) when the participant is re-visited at home in order to clarify any unclear points and to verify, confirm and alter the textual material (transcript) if necessary. My preconceptions were again changed due to this further encounter with the participant. This cycle repeats itself for each participant and my preconceptions may be changed each time.

Smith *et al* (2009) advocated steps to follow in the analytical process in IPA research studies. These have been adapted for the purpose of this research study and an account of the process is shown below:

3.3.2 Step1. Reading and re-reading

After personally transcribing the interviews verbatim the first step of the analysis was to ‘immerse myself in the data’. The transcripts were examined closely one-by-one at this stage. The audio-tape recording was listened to again while first reading the transcript. Imagining the voice of the participant during subsequent readings of the transcript assisted with a more complete analysis. After the interview itself I had recorded any striking observations about the interview in a notebook in order to capture first impressions and not forget this information.

Repeated reading allowed active engagement with the data and formed an understanding of how narratives can bind certain sections together. This reading highlighted how the rapport and trust builds across an interview and highlights the development of richer and deeper sections of the text.

A ‘global summary’ of each transcript was written at this stage to form a complete overview of the participant and her experience and maintain an idiographic focus (Appendix 13). This identifies the essential characteristics in the data from each interview or encounter with an informant (Kocklemans, 1975; Steeves, 1992b).

3.3.3 Step 2. Initial noting

This initial level of noting was detailed and time consuming and was done as the text was being read. It is important to keep an open mind and note anything of interest within the transcript. This step ensures a growing familiarity with the transcript and begins to identify specific ways that the participant talks about, understands and thinks about an issue. This is close to being free textual analysis, there are no rules about what is commented upon and no specific requirement. Some parts of the interview are richer and warrant more commentary. This ‘Initial noting’ - involved writing descriptive comments in the left hand margin and are shown in Appendix 14. It is important here to acknowledge that my midwifery experience may have influence this stage, however it also added to the understanding of the situation and contributed to the noting stage being related to practice.

3.3.4 Deconstruction

Once an understanding of the overall text was obtained, it was then necessary to focus on the participant's words, sentences and paragraphs and the meanings that these held. It is important to attempt to get closer, not to what you think that the participant is saying but to what they are actually saying. The meaning making/sense making process of interpretation was then carried out during the 'sentence analysis' (Appendix 15). Due to the large amount of data, the words and phrases that were related to the phenomena were extracted for closer examination, they were numbered and colour coded for each particular participant to allow the identification of each case. This step in data analysis involved some decision making regarding what was relevant and what was not, a similar process to editing (Cohen *et al*, 2000). Physically cutting up of the text and forming piles of excerpts on slips of paper is a crucial part of the analytic process according to Cohen *et al* (2000). Smith *et al* (2009) supported this and suggest that it is a clearer way than underlining the text which is often done. Smith *et al* (2009) also emphasised that there is no right or wrong way here and differing approaches share the fluid process of engaging with the text in detail, exploring different avenues of meaning which arise, and pushing the analyses to a more interpretative level. Following the extraction of relevant words, phrases and text, the second hermeneutic circle (Figure 3.3) details how the interpretation then proceeded.

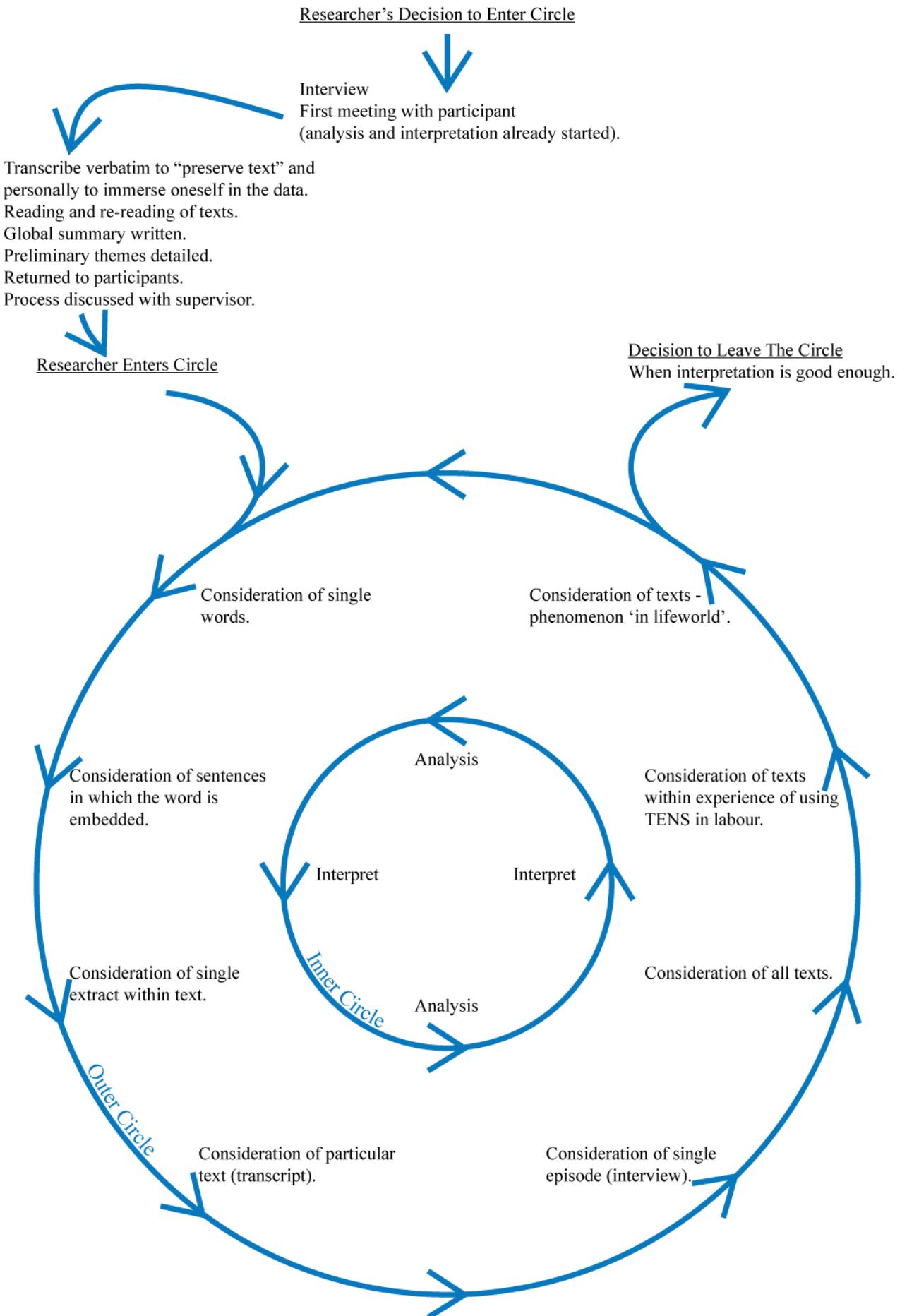
3.3.5 The Hermeneutic circle Interpretation and Analysis: part and whole

The hermeneutic circle is perhaps the most resonant idea in hermeneutic theory and argues for the dynamic relationship between the part and the whole, at a series of levels. To understand the part, you look to the whole; to understand the whole, you look to the part. This may be criticized from a logical perspective because of its inherent circularity however it is appropriate analytically in terms of describing the process of interpretation.

Figure 3.3 details the process of analysis of part and whole that was followed in this study. I engaged in movement round a virtual mini circle where, in my home location, I mentally took on again a conversation with my participant as I reheard her story, asked questions of it, tried and made sense of it. Indeed the various actions inherent in the second hermeneutic circle between part and whole took place in this cognitive space at home base. I considered the single word, the sentence in which the word is embedded, the single extract within the text, the particular text (transcript), the single episode (interview), all of the texts, and the whole experience of the phenomenon of using TENS for pain control in

labour and lastly how this sits in the complete birth experience. The whole time analysis and interpretation is taking place with the possibility of digging deeper with my interpretation. The circle could theoretically go on forever, thus the skill is deciding when to come out of the circle and commit to writing: this decision was made when I could not find anything new emerging from the data.

Figure 3.3 Hermeneutic Circle Interpretation and Analysis: Part and Whole



It is important here, as agreed by Smith (2007) when reading a transcript to remember that I am trying to make sense of the words used but I am also trying to make sense of the person who has said those words.

3.3.6 Step 3. Developing emergent themes

The transcripts were examined one by one to firstly get a feel for the experience of the particular participant, closely related to the idiographic level (section 3.1 study design). The interview transcript was numbered line by line and the phrases directly related to the phenomenon were removed to examine them closely. The colour coding and numbering assisted in allowing a clear visual recognition when combining phrases and looking for themes. This was also carried out in order to enable checking that the data actually did exist within the transcript (at a later date in the writing up phase). Large sheets were used to consider the phrases and arrange, label and cluster them. The second supervisor was asked to check this process and ensure it was followed clearly and appropriately. Initial theme headings were suggested at this stage which were brief but allowed phrases to be collected relating to similar or the same subjects/themes. The meanings were confirmed from the sentence analysis stage and initial themes emerged from this process.

3.3.7 Step 4: Moving to the next case

Step 3 was carried out for the next interview transcript and all the remaining transcripts. Each transcript (case) was considered individually. The tapes were re-listened to again in order to confirm meaning at the ideographical level.

3.3.8 Step 5: Looking for patterns across cases

The data were analysed within each case before moving to a cross-case analysis as is sometimes seen in IPA studies however it was not possible to provide such a detailed analysis of each case, due to the larger corpus. In this study the emphasis was to assess the key emergent themes for the whole group which will eventually inform practice. As recommended by Smith *et al* (2009), one identifies emergent themes at case level but holds off the search for patterns and connections until one is examining all of the cases together.

Even though analysis is at the group level themes are still illustrated with particular examples taken from individuals.

The phrases, meaning of these phrases and initial themes from each participant were grouped together to consider across all cases and develop group themes from these. The large sheets used to arrange, cluster and label phrases were amalgamated at this stage. There were a vast number of phrases from all of the cases relating to the phenomenon under study, they were all considered and initial themes were developed and then clustered and labelled to form the sub-themes and main themes. ‘Global summaries’ for each case were reviewed, even though time consuming this produced clarity for the researcher and therefore assisted in the development of the analytical process. Appendix 16 ‘From sentences/phrases to main themes’ shows an example of how each of the phrases or sentences was attached meaning/interpretive statements, clustered and labelled and sub themes and main themes developed. This was done for all of the transcripts in the study. Cohen *et al* (2000) supported this and describes making piles of passages with similar labels, and groups of text sometimes needed to be sub-divided.

Each transcript was finally documented with initial notes, clustering and labelling, sub themes and main themes, an example of part of a transcript with notes and themes is shown in Appendix 17.

Patterns and connections were then looked for across cases and the themes have been documented in Chapter 4 presenting data from each particular participant verbatim to preserve meaning and demonstrate the themes do actually exist within the data. Doing IPA with large numbers of participants constantly involves negotiating this relationship between convergence and divergence, commonality and individuality. The aim here is to retain an idiographic focus on the individual voice at the same time as making claims for the larger group.

A super-ordinate theme, which acted like a magnet and pulled all the other themes in (Smith *et al*, 1999) emerged and is closely linked and central to all of the main themes. It had a vast amount of phrases related to it which making it appear as something of extreme importance. This is discussed further in the findings and discussion chapters 4 and 5.

The labelling and clustering of phrases, initial themes and the interpretation of the meaning of these allowed the sub-themes to develop, which were grouped together to form five

main themes. This close analysis of all the cases together finally produced a ‘Full table of themes’ Appendix 18 (the super-ordinate theme, main themes and sub themes are shown coloured in blue for clarity).

For larger studies such as this, measuring recurrence across cases (participants) is important, although there are no strict rules for what counts as recurrence, the decision is influenced by the research project itself. A ‘recurrent’ theme is considered to be present in at least a third of all of the participant interviews (Smith *et al*, 2009). This counting can be considered as one way of enhancing the validity of the findings of a large corpus (Smith *et al*, 2009) and is the criterion used to identify recurrent themes for this study. Themes were recurrent if they were present in at least a third of all participant interviews in this study.

Table 3.5 below illustrates establishing recurrence and identifies the recurrent themes across cases and also within each case. The recurrence of the individual sub themes across cases is shown at the bottom of the table and is shown as a fraction out of the total (n=20). The totals for the sub-themes are amalgamated therefore the total for each main theme may be more as they often overlap. The least number of recurrent cases was seen in two sub-themes (4.1) and (C. 2) however they were still present in more than a third of all the participant interviews and therefore were included. The most recurrent themes were in all 20 of the participant interviews. A theme could occur more than once in each interview, in fact it could occur many times and phrases would then be brought together in the analysis and is shown in the findings (chapter 4). For example the super-ordinate theme of control could occur many times within each interview, however checking that the theme occurred for each participant is important and Table 3.5 demonstrates this. Appendix 13A compares the preliminary themes from participant 15 (as an example) with the final study themes, in order to check whether the preliminary themes were still present and represented within the study.

Table 3.5 Identifying Recurrent Themes within each case

THEMES	Super-ordinate Theme Control	Theme 1 Supporting the use of TENS	Theme 2 Normalising labour and birth	Theme 3 Needing to know	Theme 4 The distraction from pain	Theme 5 Trusting in TENS
Participant						
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	No	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes	Yes	Yes
11	Yes	Yes	Yes	Yes	Yes	No
12	Yes	Yes	Yes	Yes	Yes	Yes
13	Yes	Yes	Yes	Yes	Yes	Yes
14	Yes	Yes	Yes	Yes	Yes	No
15	Yes	Yes	Yes	Yes	Yes	Yes
16	Yes	Yes	Yes	Yes	Yes	Yes
17	Yes	Yes	Yes	Yes	Yes	Yes
18	Yes	Yes	Yes	Yes	Yes	Yes
19	Yes	No	Yes	Yes	Yes	Yes
20	Yes	Yes	Yes	Yes	Yes	Yes
21	Yes	Yes	Yes	Yes	Yes	Yes
Individual recurrence of sub Themes	C1-Internal control of 'self'=18/20, C2-Eternal control of others=7/20, C3-Control of the TENS machine=20/20	1.1-The Midwives support antenatally =13/20, 1.2-The Midwives' support in labour=14/20, 1.3-Partners support=17/20	2.1-Being mobile=16/20, 2.2-Natural and 'Drug free' =19/20	3.1-Gaining knowledge=19/20, 3.2 Practicalities of TENS=20/20	4.1-Security feeling=7/20, 4.2-The distraction by TENS=12/20, 4.3- Physical sensation =20/20	5.1-Believing in TENS=11/20, 5.2-Confidence in TENS=15/20
TOTAL Combined recurrence	20/20	19/20	19/20	20/20	20/20	17/20

*Note-Participant Number 1 was the 'practice interview' and was not included in the main study.

The analytical process for this research study has been summarised below in Table 3.6 in order to clarify the steps taken. Appendix 19 shows the analysis of the data using the recommended stages by Smith *et al*, (1999). This concludes the data analysis and therefore Chapter 3. A diagrammatic representation of the themes is presented in Chapter 4 (Figure 4.1) this shows how control is central to the other five main themes, the divisions within the main themes, namely sub-themes are also shown and a key lists the main themes and sub-themes for clarity. Chapter 4 will now detail the findings.

Table 3.6 Summary of the Analytical Process

ANALYSIS OF VERBATIM TRANSCRIPTS

Preparation

Interviews personally transcribed verbatim
All names and places removed to preserve anonymity
Annotations added as per guide - Appendix 7
Reading and re-reading of each transcript
A global summary was written for each participant - Appendix 13
Preliminary themes were developed
Transcripts and Preliminary themes taken back to participants for confirmation
All transcripts colour coded and numbered by participant, page and line

Interpretation

Transcripts examined one by one (case-by-case) to maintain an idiographic focus
Further reading and re-reading each of the transcripts was carried out and notes were recorded down the left hand margin of each transcript-Initial noting – Appendix 14
Large sheets of paper were used to arrange the phrases for each transcript
Hermeneutic circles were used as a way of considering the ‘dynamic between researcher and participant’ and interpreting the data ‘part and whole’ Figures 3.2 and 3.3
Phrases were numbered by page and line in order to be able to check back in the data/transcript (at a later date) that they actually exist within the data
Phrases directly related to the phenomenon under study were removed to consider the meaning of the phrases-Sentence analysis - Appendix 15
Themes started to emerge from arranging the phases from each transcript

Combining/Interpreting

The phrases were grouped together from all of the transcripts
Phrases and their meaning were arranged, labelled and clustered and combined if similar or the same as other phases-From sentences to main themes - Appendix 16 & 17
Labelling and clustering allowed the consideration and development of a super-ordinate theme, main themes and sub-themes for all of the transcripts
A complete table (Appendix 18) shows the coding scheme for the labelling and clustering and development of the emergent themes (coloured blue for clarity)

Confirmation of Interpretation

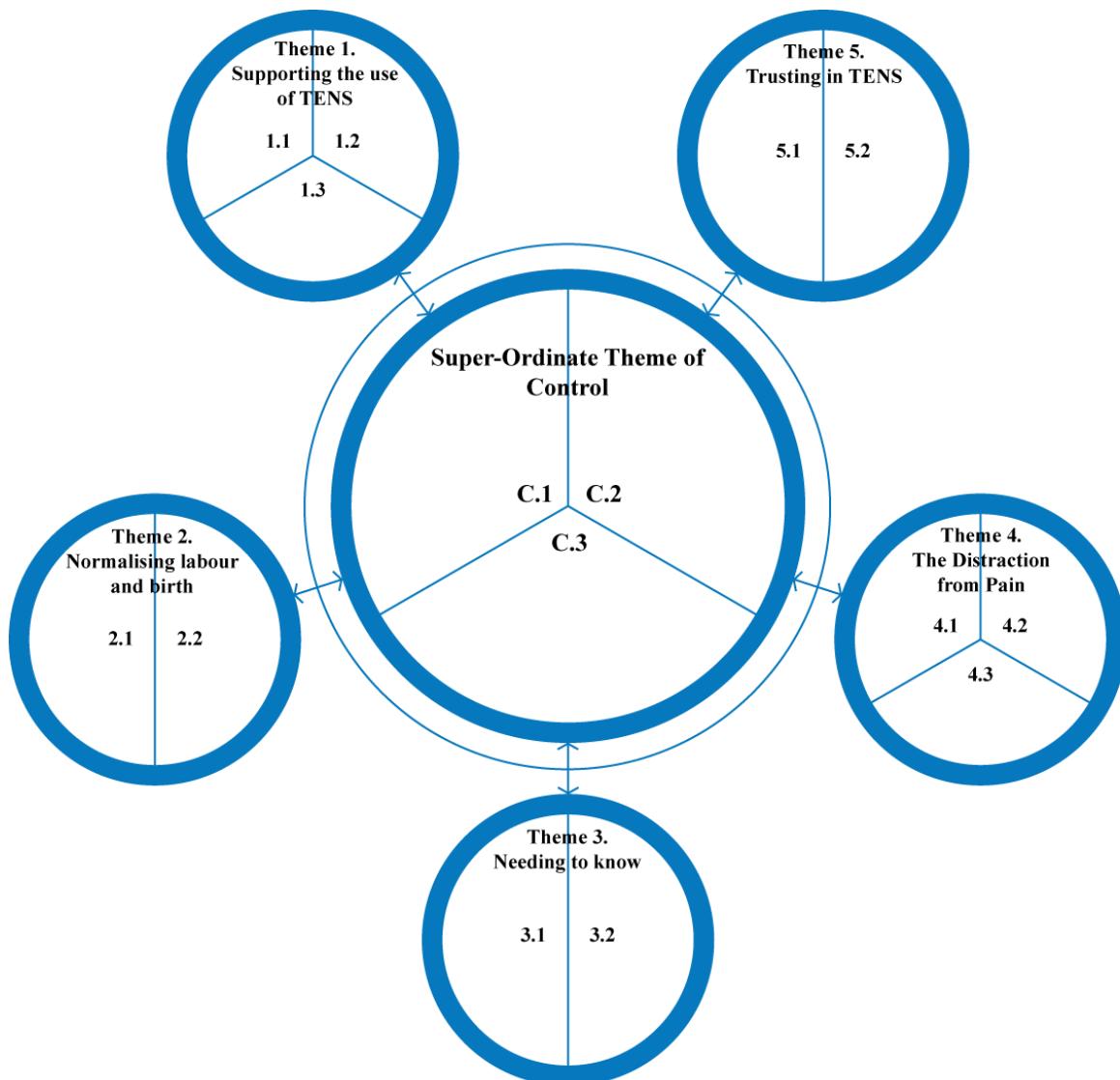
Themes were confirmed by checking back with the aid of the transcripts
The audio-tapes were used to confirm meaning and the themes when necessary
Phrases were combined in envelopes and labelled with each theme or sub theme in order to consider meanings together as a whole (across case analysis)
Discussion with supervisors confirmed progress of analysis/interpretation processes
Analysis continued throughout writing the findings and discussion sections

CHAPTER 4 THE STUDY FINDINGS

The findings presented in this section develop further the information presented in Figure 4.1 and the full table of themes (Appendix 18). The findings derived from interviews with each of the study participants illustrate participants' experiences of using Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour. The findings are presented from the perspective of the participants and will be set in the context of the whole labour and birth experience. As described in Chapter 3 data analysis was undertaken both within each participant's individual text and also across the texts as a whole. This aimed to retain an idiographic focus on the individual voice whilst at the same time making claims for the larger group. In this chapter each theme will be presented individually for clarity and then the data will be discussed collectively in order to illustrate the phenomenon itself.

Interview data are presented verbatim using phrases to support and illustrate the findings, in an attempt to keep the emphases intact and preserve meaning, whilst adding substance, meaning and truth to the themes. These verbatim phrases allow readers to grasp essential meaning and to support the researcher's interpretation of the data. 'Exemplars' are also used to demonstrate or express themes where appropriate and are pieces of textual data in the language of the informant that capture essential meanings of the themes (Cohen *et al*, 2000).

Figure 4.1 Diagrammatic Representation of Themes



Key of Themes:

Super-Ordinate Theme of Control

- C.1 [Internal control of self](#)
- C.2 [External control of others](#)
- C.3 [Control of the TENS machine](#)

Theme 1. Supporting the use of TENS

- 1.1 [The Midwives' support antenatally](#)
- 1.2 [The Midwives' support in labour](#)
- 1.3 [Partner's support](#)

Theme 2. Normalising labour and birth

- 2.1 [Being mobile](#)
- 2.2 [Natural and Drug free](#)

Theme 3. Needing to know

- 3.1 [Gaining knowledge](#)
- 3.2 [Practicalities of TENS](#)

Theme 4. The Distraction from Pain

- 4.1 [Security feeling](#)
- 4.2 [The Distraction by TENS](#)
- 4.3 [Physical sensation](#)

Theme 5. Trusting in TENS

- 5.1 [Believing in TENS](#)
- 5.2 [Confidence in TENS](#)

The challenge here is to present the experiences in a way that is *faithful to the original* and by the use of verbatim phrases throughout the findings section hopes to achieve this. Denscombe (2003) said that -

‘This entails the ability to see things through the eyes of others, to understand things in a way that they understand and to provide a description of matters that adequately portrays how the group in question experiences the situation’ (Denscombe, 2003:98).

The findings of the study will be presented in the form of the women’s experiences, through a super-ordinate theme, main themes and sub-themes. The women are central to this research study and this approach is consistent with phenomenology, hermeneutics, IPA and midwifery. As the researcher, I aim to interpret the participants’ interpretation of the phenomenon of using TENS in labour.

Following a summary of the study participants’ (section 4.1) and a table of the sample characteristics, the study findings are presented sequentially, reflecting the process of hermeneutic inquiry, characterised by an ever deepening interpretation, understanding and description. This is done from a midwifery perspective as well as a researcher perspective. The use of the word ‘participant/s’ will be interchanged with ‘woman/women’ for the purpose of presenting the findings: this is necessary to present and set some of the findings in the context of the phenomenon. The verbatim extracts from the transcripts are included and are coded by participant number, page of transcript and line number for each extract in order to prove that the quote actually exists within the text. In order to identify a particular participant ‘P’, is followed by the participant number and appears in brackets (P.15).

Section 4.1 sets the study sample in context and the super-ordinate theme, main themes and sub-themes are presented within Section 4.2. The full table of themes (Appendix 18) may be useful to refer to at this point before reading this chapter. Figure 4.1, the ‘diagrammatic representation of themes’ shows how control was central to all of the other themes and appears larger due to its super-ordinate status and has the other themes containing their sub themes surrounding it, but at the same time inter-linking. Section 4.3 – 4.8 Details the findings within each theme and across cases and lastly Section 4.9 details the key points and the findings are then summarised in Section 4.10.

4.1 The Sample

The sample consisted of 20 women, 13 women having their first baby (primi-gravid) and 7 women having subsequent babies (multi-gravid), who had used TENS for pain control in labour and fitted the inclusion criteria (Table 3.1). The sample consisted of 14 women who had a hospital birth and 6 women that had a home birth who were all booked under the same NHS trust in the South of England. The age range for the participants was 19 to 40 years old. The interviews all took place in the participants' own homes, which were in urban and rural locations. The sample was recruited much more quickly than expected which highlighted just how many women were using TENS within this geographical area. The sample characteristics in Table 4.1 show that the accessibility for obtaining a TENS machine for this study sample was good. The sample participants used many different TENS machines which were obtained from different places. The majority had either borrowed the machine or hired it locally (17/20). One participant had bought her own TENS leaving only two participants that hired their TENS machine via the internet.

Table 4.1 Sample characteristics

PARTICIPANT Number	AGE	PARITY	PLACE OF DELIVERY	TENS ACCESS
2	24	G1 P1	Hospital	Hired locally
3	31	G1 P1	Hospital	Hired locally
4	28	G1 P1	Hospital	Hired locally
5	30	G1 P1	Home	Hired locally
6	37	G2 P2	Hospital	Borrowed
7	20	G1 P1	Hospital	Borrowed
8	19	G1 P1	Home	Borrowed
9	27	G2 P2	Hospital	Hired locally
10	30	G2 P2	Home	Hired locally
11	35	G2 P2	Hospital	Hired locally
12	32	G1 P1	Hospital	From work
13	28	G1 P1	Home	Hired locally
14	26	G1 P1	Hospital	Hired locally
15	31	G2 P2	Home	From work
16	28	G3 P3	Home	Bought-ebay
17	31	G3 P3	Hospital	Hired-internet
18	31	G1 P1	Hospital	Borrowed
19	40	G1 P1	Hospital	Borrowed
20	23	G1 P1	Hospital	Mums tens
21	31	G1 P1	Hospital	Hired-internet

(G (gravida)=number of pregnancies, P (para)=number of births)

All of the participants were returned to after the transcription process was completed for checking accuracy of the data, and for clarification and confirmation of the text where needed. One participant was preparing to move to Australia, and was keen to forward her details for contacting her if necessary and to receive a research summary once the thesis has been completed. None of the sample withdrew from the study and all 20 interviews

were able to be transcribed and analysed. The practice interview (Participant No. 1) has not been included.

4.2 Emergent themes and sub-themes

The analysis and interpretation of the data has identified six main themes, all of which have sub themes, a full table showing the labelling and clustering of themes can be seen in Appendix 18. One of these themes appeared as a super-ordinate theme which is closely related to the other themes. This theme has been labelled ‘control’, it has three sub themes that will be used to present and discuss the findings. These are internal control of self, external control of others and control of the TENS machine. The five other themes that emerged from the data are all related to the super-ordinate theme and therefore often overlap which can be seen in the findings and is in keeping with studies with a phenomenological orientation as experiences do not exist solely or in separated units rather they are intertwined with each other. The first of the five main themes is ‘supporting the use of TENS’, with sub themes of ‘the midwives’ support antenatally’, ‘the midwives’ support in labour’ and ‘partner’s support’. The second theme is ‘normalising labour and birth’ with sub themes of ‘being mobile’ and ‘natural and ‘drug free’’. The third theme is ‘needing to know’, with sub themes of ‘gaining knowledge’ and ‘practicalities of TENS’. The fourth theme is ‘the distraction from pain’ with ‘security feeling’, ‘the distraction by TENS’, and ‘physical sensation’ as sub themes and lastly the fifth theme called ‘trusting in TENS’ has ‘believing in TENS’ and ‘confidence in TENS’ as sub themes within this main theme. The themes will be presented separately for clarity, however cross referencing will document how and where they are related to each other.

Table 4.2 summarises and outlines the super-ordinate theme, main themes and sub-themes that have emerged from analysing the data showing the order in which the findings will be detailed in this section. Appendix 18 details the themes in full.

Table 4.2 The Super-Ordinate Theme, Main Themes and Sub-Themes

<u>SUPER-ORDINATE THEME</u> Sub-Themes (n=3)	‘CONTROL’ C.1 Internal control of self C.2 External control of others C.3 Control of the TENS machine
<u>MAIN THEME</u> Sub-Themes (n=3)	1. ‘SUPPORTING THE USE OF TENS’ 1.1 The Midwives’ support antenatally 1.2 The Midwives’ support in labour 1.3 Partner’s support
<u>MAIN THEME</u> Sub-Themes (n=2)	2. ‘NORMALISING LABOUR AND BIRTH’ 2.1 Being Mobile 2.2 Natural and ‘Drug Free’
<u>MAIN THEME</u> Sub-Themes (n=2)	3. ‘NEEDING TO KNOW’ 3.1 Gaining Knowledge 3.2 Practicalities of TENS
<u>MAIN THEME</u> Sub-Themes (n=3)	4. ‘THE DISTRACTION FROM PAIN’ 4.1 Security feeling 4.2 The ‘Distraction by TENS’ 4.3 Physical sensation
<u>MAIN THEME</u> Sub-Themes (n=2)	5. ‘TRUSTING IN TENS’ 5.1 Believing in TENS 5.2 Confidence in TENS

4.3 Super-ordinate theme - ‘CONTROL’

The theme of ‘Control’ has emerged from the data after interpreting the texts as a ‘Super-Ordinate theme’, acting as a magnet pulling the other themes in. ‘Super-Ordinate status’ is acquired as it brings the other themes together (Smith *et al*, 2009:97). In this study control therefore sits ‘centrally’ to the other main themes and sub-themes and is related to all of them. Figure 4.1 shows a diagrammatic representation of all the emergent themes with a key showing the sub themes in order to visually present the themes and their situation to each other.

The interpretation of the data, part and whole showed overall that all of the study participants talked about control and its importance in some way. The number of phrases extracted and examined from each of the other five themes ranged in amount from 52 to 199, however there were a total of 304 phrases from the participants relating to control, far exceeding any other theme and identifies control as being something of extreme significance. Control was mentioned by all of the participants in the study (Table 3.5). In addition, the importance of being ‘in control’ and being ‘in charge’ could be felt during data collection and were strongly expressed by many participants using and emphasising very “powerful” comments. It is however acknowledged that control has different

meanings and degrees of meaning for each participant and the verbatim quotes have been used to express this.

The following exemplar captures the theme of 'Control' including all three of its sub themes (control of self (C.1), control of others (C.2) and control of the TENS machine (C.3) and is an example of the importance and confidence of many participants who powerfully expressed the whole ethos of control -

'By the time I got to the hospital they (the midwives) asked me to get changed, which isn't the easiest thing to do with the TENS machine on but that was fine because '**I wasn't taking it off**', I started taking the gas and air in massive quantities but then it was making me feel sick and dizzy so **I ditched** the gas and air and **turned up my TENS machine**...The **controllability** of it definitely was very important to me' (P.6).

This highlights that some women want to be allowed to exercise control and to be supported to maintain this without having to challenge others such as the midwife, partner or obstetrician for it. This participant had felt the need to assert herself and emphasised much of what she was saying (in bold type) expressing meaning. She felt that the midwives did not support her use of TENS and that they gave the impression that the TENS was not enough for pain relief, encouraging the use of entonox (gas and air) even though she had expressed a preference not to have it. Within the theme of control, the three sub themes will now be presented in order.

4.3.1 Internal control of self

Internal control of self is associated with a personal level of control and incorporates emotions, feelings and thoughts, behaviour, pain and physical functioning of which TENS is voiced as being a large part and is closely connected. The verb 'control' has been expressed by Spooner (1991) as to 'be at the helm of', to 'be in charge of', to 'cope with', 'to deal with' and 'to have control of', which all relate to women that are trying to manage their labours and maintain a sense of authority over it. Eighteen out 20 of the study participants articulated this in some way in their interviews.

The following two quotes are examples of how the participants summed up the TENS machine supporting them to maintain control of themselves within their labours without restricting them - 'It (TENS) enabled me to do exactly what I wanted to do, exactly when I needed to do it' (6.3.4), 'The TENS machine made me totally in control' (7.6.46).

Factors that were associated with affecting control and helping participants to cope with the pain such as being calm, relaxed, confident and being able to concentrate were expressed as having a positive effect on labour and in some cases if absent or removed had reduced self control. Participants expressed how the TENS contributed positively to these feelings - 'I could feel my body tensing but when I came downstairs and put the TENS machine on I calmed down' (17.6.40), 'I was trying to keep relaxed and under control...It (TENS) helped...It was amazing...It sort of made you more relaxed' (20.6.12), and with the TENS on participants were able to focus on each contraction allowing the maintenance of control - 'You feel like you are responding to each contraction individually...It was all kind of calm and relaxing' (15.3.18).

Being calm and relaxed in turn seemed to effect 'the breathing' and helped to keep it under control and is articulated by many participants - 'I was trying to concentrate on my breathing, keeping it calm and relaxed' (21.5.21), 'I just tried to relax and breathe through...I was breathing and puffing out with the pain...I was calm and relaxed and controlled throughout labour' (19.6.34). Successful use of breathing techniques therefore seemed to help maintain relaxation, calmness and therefore the feeling of control, TENS was part of this cycle in supporting these elements.

Conversely, situations that take away the calm and relaxed atmosphere influenced the participants' ability to stay in control. There is a strong link between being in control of themselves as well as others and the environment (section 4.3.2), the two sub-themes often become inter-twined. When participants moved from their own home environment to the clinical hospital environment feelings of anxiety and tension developed which in turn had a negative effect and decreased control. One participant particularly expresses this with reference to the environment affecting her previous inner calmness - 'Coming into the hospital made me feel a lot more tense' (21.5.42).

This is perhaps the reason for four of the participants who had chosen to birth in hospital wanting to stay at home for as long as possible whilst in labour. They expressed feeling in control and comfortable at home whilst using TENS - 'I was not ready to go to hospital

and was comfortable on the TENS, so I stayed at home' (19.2.18), 'I wanted to stay at home for as long as I could and the TENS machine was working really well (9.2.27).

Control was often related to the participant's confidence in herself and therefore in the TENS and vice versa, this was expressed in the meaning of some of the phrases from the participants, for example - 'I was coping well with the TENS and I was confident with the TENS being enough pain relief' (21.5.44), you can hear the meaning and emphasis in the participants words for example 'It was important to me to have that control, yes it was good' (9.9.32), 'I'm sitting here with this machine on and I'm doing alright, you know it gave me confidence' (21.21.26). One participant expressed that she had been confident but was apprehensive about taking the TENS off 'When I took the TENS off I was quite nervous' (15.12.25). The TENS therefore had contributed in boosting confidence for the majority of participants.

A very interesting finding has presented itself within the data, that is the emphasis of 'self', namely 'I', 'me', 'my own', 'myself'. The majority of the participants acknowledged responsibility and present very strongly the idea that they wanted to control the TENS apparatus themselves and be independent, without having to ask or rely on anybody else, they want to be totally in control of their own pain. Women actively engaged in the labour process-they were centre stage and the narratives revealed this. The use of 'I' and 'self' seemed to be emphasised more within the transcripts when the participants were talking about control. Many women felt that 'only they' could know what the pain was like and when it was coming. In order to demonstrate the extent to which this appeared in the text, the phrases have been put into the table below and the expression of the 'self' has been underlined (participant's emphasis in bold type).

Table 4.3. Phrases related to the ‘self’ and being in control

Participant number	Verbatim Phrases
(15.9.27)	‘It was important that <u>I</u> felt in charge of it (TENS)’
(9.9.31)	‘ <u>I</u> don’t like things being taken out of <u>my</u> control’
(14.8.8)	‘ <u>I</u> liked the fact that the TENS was in <u>your</u> control’
(14.15.34)	‘ <u>I</u> did like the fact that <u>I</u> could sort of control it all the time’
(19.7.19)	‘ <u>I</u> was totally in control of <u>my</u> own pain’
(5.5.20)	‘ <u>I</u> knew the machine very well, <u>I</u> knew how to control it’
(7.8.25)	‘Nobody could take it off <u>me</u> , it was <u>mine</u> ’
(9.12.7)	‘ <u>I</u> don’t think that <u>I</u> would have trusted anyone else to do it’
(4.2.21)	‘ <u>I</u> was holding it, <u>I</u> had the control and <u>I</u> could turn it up’
(5.2.47)	‘ <u>I</u> operated it at all times’
(11.2.3)	‘ <u>I</u> was controlling the TENS machine <u>myself</u> ’
(7.3.9)	‘Being totally in control and not having to ask anybody to do it for <u>me</u> ’
(15.14.2)	‘ <u>I</u> just wanted to do it <u>myself</u> , that was part of it, pressing the button and dialling the thing up’

Being calm and in control affects concentration for most women. The TENS helped with concentration in the majority of participants, helped them to focus and make labour more manageable, and was sometimes linked with diversion/distraction - ‘It just made me concentrate on something, rather than just the pain’ (18.1.48). Similarly, another participant needed to be able to concentrate and feel the sensation in order to use meditation in labour - ‘I was just literally concentrating on the TENS machine going ‘bob’, ‘bob’, ‘bob’, and putting this sensation through me’ (4.2.45).

Meditation therefore combined concentration and distraction (section 4.7.2) and was only verbalised by this one study participant, however, for this particular participant meditation was very important to her and she had prepared for labour by using a meditation tape for use with the TENS when labour began. The actual pulsations of the TENS machine were hypnotic for her and assisted with her meditation, she says ‘Every time the TENS machine was buzzing, I just kept telling myself that the pain won’t last...It’s the hypnotic sort of sensation that you don’t get from anything else’ (4.6.39).

Concentration was enhanced for one participant that used TENS alongside praying throughout her labour - ‘I wanted to pray through my labour as well, so that helped me’ (18.5.11). Meditation and praying were beneficial for these particular women and were used in conjunction with the TENS, although this was not mentioned by the majority of participants. Maintaining an idiographic focus is important here and this could be information that is useful to other women (see Chapter 5).

Type of personality was mentioned by some participants who thought that it was not all women that would feel that they needed to be in control in the same way as they did, but being in control definitely mattered to them because of the type of person that they were - 'I was very much on my own and didn't want any help so the fact I could control it was a personality thing' (4.6.3), 'I do like to be in control of most situations' (9.9.30), 'I am the sort of person who really likes to be in control (13.5.27). Linking in with type of personality was 'being assertive' and being able to maintain the strength to make decisions in labour was linked to control and many participants voiced 'powerful' statements - 'I threw the gas and air down, but still had the TENS on at the very end' (14.6.9), 'I declined all other pain relief, It was just nice to know I could control it (TENS)' (19.6.31), 'Once I had the TENS machine on I said I'm **not** having a bath' (9.8.1).

Participants talked about control in psychological terms - 'Whether its psychological or not I don't know, it definitely helped me feel more in control' (11.4.44), 'There's probably a psychological bit where you feel you're in control as well, which is a good thing' (16.5.23). Psychologically, for one participant she felt that because she needed to increase the TENS she was confident that her labour must be progressing - 'Because I had to turn the TENS machine up, meant that the contractions were getting worse and the labour was progressing' (15.14.16).

The majority of participants who had experienced previous labours talked about them and comparisons were made. Their thought processes naturally led them to think about what they had felt and experienced in order to put their current experiences in context. The reference to being 'out of control' in previous labours was mainly due to the effects of using pharmacological analgesia (section 4.5.2). Many phrases often related to more than one theme, this participant expressed feeling totally awake without taking any pharmacological analgesia - 'It (TENS) didn't make me feel woozy, I didn't lose consciousness, I didn't lose the feeling in any part of my body, it made me feel much more in control' (7.6.47), another participant wanted to verbalise her 'lack of control' with her last labour which affected her decision to use TENS this time 'With pethidine last time I didn't feel in complete control, I felt very drunk' (11.3.35). One participant found it difficult to control the TENS when combining it with gas and air (entonox) - 'The gas and air made me feel woozy and it was difficult to control the TENS machine' (3.4.19). The combination of using entonox and TENS was useful for some women, however it was not beneficial for others, highlighting the importance of maintaining an idiographic focus because every woman has a different experience.

Interestingly, descriptions of the pain itself were not often mentioned even though the labour experience focuses on pain and the TENS is seen as a form of pain relief, or 'control' for the purpose of this study. Participants did however talk about how the TENS helped with the pain when using it - 'It was lovely I could talk normally without the pain talking where the words catch in the back of your throat' (3.2.27), 'It was helping with controlling the pain, I was trying to deaden the pain' (11.3.17), 'I'm not taking the TENS off to see if its or painful without it' (21.7.21), 'It definitely did feel like it was helping to control the pain' (6.1.13), 'It was another stepping stone to trying to get rid of the pain' (11.9.22).

For most participants TENS supported control through dealing or coping with each contraction individually. One participant particularly had the TENS machine turned up very high with the aim of counteracting the contraction pain and said -

'Its really sort of pounding its painful almost on the back but you are sort of craving that pain to get rid of the labour pains...When you're in labour I think you're just desperate for something to sort of stop the pain and you go with it' (9.14.19).

TENS was often used as a combination with other natural forms of pain control, such as yoga and breathing - 'I started doing a bit of yoga and breathing and dialling up the TENS' (15.1.31), this participant also used water for pain control after taking off the TENS by entering a birthing pool. TENS was also often used with entonox by many of the participants - 'With the TENS and gas and air you're very much more in control' (11.3.32). Meditation and praying have already been mentioned and are considered to be associated with natural methods along with mobilisation, which will be discussed in section 4.5.1.

Participants often talked about the period of time that TENS was used in their labours - 'I carried on using it all the way through' (13.4.25), 'It (TENS) did help me through a large chunk of it' (labour) (3.5.41), 'I felt that TENS got me halfway through my labour' (21.10.28).

One participant who was in labour for the first time needed to increase the TENS very quickly, was fully dilated and delivered very soon after arriving at the hospital says - 'By the time I got to the hospital the TENS was pretty much on maximum' (4.1.36).

Another participant had managed to get through most of her labour - 'When I got to the hospital I was 8 centimetres dilated' (12.4.32). This highlights that for many women using TENS in their own home environment was important to them and there was no need to change what was working well. They felt safe and secure (section 4.7.1) within this environment, which in turn affects control and leads on to the second sub-theme of this section.

4.3.2 External control of others

Having 'external control of others' is equally as important as being in control of oneself during labour and both have an impact on each other. For the women in this study, this sub-theme related to being in control of others around them and maintaining this level of control throughout labour and birth. The meaning of 'external' control here is similar to the concept discussed by Green *et al* (1998:19) of women's 'control over their environment and all that is done to them'. This is not to be confused with having a high external locus of control as described by Heinze and Sleigh (2003) which generally means that women want to hand over the control to others/professionals.

In this study the meaning of 'others' has been broadened to encompass the environment as well as other people and their behaviour towards the woman in labour. These people include the woman's partner and family members as well as one or more of a range of professionals. Just over a third (7/20) of study participants talked about this sub-theme and it was important for those particular women to maintain this external control themselves. Participants expressed the importance of controlling others and all that was going on around them, reference was made to the atmosphere as being part of the environment. TENS supported the participants in allowing them to feel in control of the whole situation and is demonstrated in the following exerts in Table 4.4.

Table 4.4 Phrases related to being in control of others

Participant Number	Verbatim phrases
(7.7.40)	'I felt that much more in control of everything'
(15.9.14)	'It actually makes you feel like you are in control of what's going on'
(15.9.19)	'It really felt like I was taking charge of what was going on, which was really helpful'
(8.4.46)	'I liked the feeling that I'm in control of everything, and not out of it'

In the following example the participant was trying to maintain control, however it appears that the midwife had influenced the decision to take the TENS off when the participant clearly did not want this -

‘She (the midwife) said that ‘it wouldn’t really be doing anything for me’ I said ‘well I don’t want to, I don’t want to take it off’ ...She (the midwife) said ‘well let’s take it off and just see if it changes your pain levels, you can pop it straight back on again’ (12.5.21).

The participant then took the TENS off due to the midwife’s recommendation which removed her control and support mechanism. The power of the midwife to be able to do this is interesting but could it be that the midwife is trying to be in control and removes the control from the woman or alternatively perhaps the midwife cannot cope with seeing the woman in pain therefore she tries to persuade the woman to use alternative pain control methods. Women that possess extremely high self esteem and control can assert themselves and override the midwife, this was demonstrated by the exemplar exert at the beginning of the control section by participant 6 being assertive and throwing down the entonox and turning up the TENS machine higher to maintain control of herself and others that were present.

Participants verbalised that being able to control the external environment and others was much easier to do at home. One participant prepared her labour area/room at home and ensured it was visually calm and relaxing before the birth, giving her the feeling of control of the environment where she was going to experience the birth. The same participant lost control when there were more people around her than she wanted - ‘I felt in control all the way along apart from when there were lots of people in my house’ (15.9.30). This was rectified by asking people to leave and she regained her control of the situation once again, something that would be difficult to do in a hospital environment.

Participants generally controlled what the partner was allowed to do in labour. His part was often the timing of contractions, applying the TENS machine and supporting where needed, which will be discussed within section 4.4.3. Women were often able to maintain control through their partners physically controlling the TENS with instruction from them.

One participant remembered getting very distressed and needed her partner to control the TENS machine until she was able to regain her focus and therefore her control. She

operated the TENS through her partner by giving specific instructions of when to press the 'boost' button with the contractions -

'He had read the instructions and it was better for him to operate it as I was getting quite irrational...he was calm and rational...he was just pushing the buttons...I didn't actually have to do it I could just say 'do it' and it was done, rather than to have to fiddle with it...looking back on it, it was nice that he (partner) could control it as it made him part of it' (8.3.8), and she goes on to relate this to her control - 'It didn't bother me not being in control of that bit (the TENS) as I was in control in the way that I was telling my partner to 'put it up...put it down' (8.7.6).

Other participants also remained feeling in control through giving their instructions - 'he would only ever press it once up, so I was still 'in control of it', as it were' (12.7.33). Partners were able to feel involved and very much a part of the labour whilst providing this support.

The participants' views were therefore mixed regarding physically controlling the TENS. Some participants felt that someone else couldn't control the TENS 'By the time you tell someone its too late for them to fiddle with it (9.7.1), some felt that it could be handed over if needed 'If I hadn't been able to turn it up myself, then someone else could have done that' (4.2.38) and others who felt that it was really useful having something that could be controlled by a partner if this was needed or requested 'Towards the end I gave it to my Mum and it was nice knowing that I could just nod because I had my hands full (7.8.30). This reinforces that every woman's experience is very different and is influenced by her feelings, beliefs, pain, control and how she feels at that particular time of her labour and what is and is not helpful for her.

4.3.3 Control of the TENS machine

The third sub-theme of 'control of the TENS machine' was talked about by all 20 of the study participants. The majority of participants felt in control enough to make their own decisions and choices relating to the application and operation of the TENS machine - 'This is established labour and I'm putting my TENS machine on' (13.3.7), 'I decided that I needed some help with the contractions, so my decision was to put the TENS on'

(12.9.36), 'You can take it off at anytime and you don't have to keep it on' (11.10.32), 'It was my decision if I upped the controls' (21.16.13).

Most of the participants stressed the importance of actually controlling the TENS machine themselves and forming an attachment with the TENS - 'I did like the fact that I could control it (TENS) all the time' (14.15.34), 'No-one else knows when you are starting a contraction, you need to control it (TENS)' (9.6.50), and -

'The TENS was working fine, I was starting to turn up the intensity a bit as it was getting more painful...you have to control it yourself, because only you know when the contraction is coming...I do think that you get quite attached to it' (17.3.3).

This physical action of having something to hold and to control is vital to some participants -

'I wanted to be in charge of it completely, I liked hanging onto the buttons because it felt like I had got something...it just felt like you were in control of it' (15.15.13).

Similarly to the sub-theme 'internal control of self', particularly 'I' and 'myself' are verbalised again by the participants, but this time were specifically related to the TENS machine and being able to vary it depending on the strength of the contractions - 'I was just doing it in little stages for myself, I wanted something that I can control' (16.5.18), 'It was good to have something that you felt you were proactively controlling, not just being passive' (11.3.27), 'You gradually turn it up as the pain gets worse, I would turn it up while I was having a contraction and it did help quite a lot' (20.2.28).

In comparison to this some participants preferred to control the TENS machine through their partner or let the control of the TENS machine be the partner's role for a certain amount of time. The participant still felt in control of herself, her labour and the environment but this was done through her partner, an example of this is expressed -

'I would just say to him 'I'm, having a contraction now, turn it up', 'I was confident that he knew what he was doing because he was calm and rational, he had read the instructions' (8.2.49).

This participant felt that she had maintained her self control and control of the TENS machine through her partner (section 4.4.3). There is therefore, always the option that if the control of the TENS machine affects internal control of self and it becomes too much to think about it can be handed over if need be as expressed by this participant - 'If I hadn't been able to turn it up myself, then someone else could have done that' (4.2.38).

Participants made reference to the importance of the actual TENS machine (box), the buttons and physically 'holding the machine in their hand' - 'I just wanted to hold it, I was holding the actual object 'the machine' in my hand...It was my 'control box' (2.4.32), 'This was mine, I just didn't let this button go and it was in my hand' (9.3.43).

The 'controllability' of TENS was expressed by some participants when being able to control the TENS machine with ease depending on the stage and severity of the painful contractions, an example of this is - 'It was easy to control, with the up and down buttons' (14.11.25), 'The controllability of it definitely was very important to me...I could still control how much relief or otherwise I got from it' (6.2.22), 'You are in control of it, it is not in control of you' (11.10.36), 'It was something there that I could change if I needed to if the pain was greater' (20.9.1).

Most of the participants wanted to express what level they had been using, were comfortable with or had got up to with the TENS, the levels vary with each machine, however it seemed important to them to verbalise this aspect - 'You gradually notch it up to a level that you feel comfortable with...I put the TENS on the highest because the contractions were strong and uncomfortable' (19.3.24), 'You want it at a comfortable level' (11.6.39), 'I needed more sort of power from the TENS so I put it up higher' (9.11.44), 'You can just put it on yourself and start using it at what level you need' (5.5.23).

Some participants articulated a numerical level, which obviously felt important to them to do and expressed how far they had got through their labours with the help of the TENS - 'It started around 1-2 quite low, I had it up to 7, quite high in the end' (2.7.17), 'I could judge what level I could be at...It was up on 8 before I really knew that I was there...The TENS machine stayed on 8 all the way through when I was pushing' (4.3.46), 'I didn't actually take the TENS machine off until I was quite far gone' (11.3.18).

The majority of modern maternity/obstetric TENS machines have a 'boost' facility (boost button), sometimes called a 'burst mode' which increases frequency and intensity of the sensation to give a continuous feeling rather than a pulsing sensation (section 4.7.3). The 'boost' mode has been expressed strongly in helping to control the pain particularly allowing the participants to focus on each contraction individually. The option of being able to have the pulsations and the continuous sensation was also important to some participants. This participant sums this up -

'I liked the fact that you could have the pulsations and the boost, the contractions were getting seriously strong and seriously painful and I was boosting it all the time, not to have the option to boost I think would have been also the wrong thing for me' (6.3.15).

This participant verbalises the helpfulness of the boost by saying -

'I was having difficulty controlling the pain but the TENS machine was great because when I was having a contraction I was able to use the little button to do the boost which really helped' (11.1.40).

In order to show how important the boost was the Table 4.5 details the phrases some of the participants used -

Table 4.5 Phrases relating to the boost button/facility

Participant number	Verbatim phrases
(17.13.17)	'The whole 'boost thing' for the contractions was brilliant'
(13.3.32)	'As soon as I felt the pain coming I started the boost'
(13.3.25)	'I was using a 'very low setting' and the 'boost function' during contractions, which was good'
(10.6.45)	'Just having something that was mine almost and nobody else can tell when you want that boost button pushed'
(21.6.32)	'My thumb was permanently attached to the burst button in the car'
(10.7.16)	'I'd run out of gas and air and that's when the booster button became the whole focus of absolutely everything'
(7.3.8)	'Just being able to sort of press the button and make myself feel better was nice'

Some older machines do not have this mode or facility and the machine has to be manually increased with each contraction for better effect, however this is more difficult for the participant - 'Mum's machine didn't have a boost button, so I just turned it up if the

contraction was painful, I would turn it up while I was having a contraction and it did help a lot' (20.3.25). Even with the most intense pain the participants expressed that the sensation of the boost mode on the TENS machine became the focus and was used to control the pain and cope with labour.

4.3.4 Summary of theme of Control

Control was very important for all of the participants and was influenced by many factors such as being calm and relaxed, feeling confident, being able to concentrate, enhancement of breathing techniques, personality and wanting to be independent. Maintaining control was verbalised in a very 'powerful' way and was expressed as 'being in charge of', 'dealing with' and 'coping with' the pain of labour of which the TENS machine played a large part in facilitating and enhancing these aspects. Participants acknowledged responsibility and independence and wanted to take control themselves. Some participants used distraction, praying, breathing, yoga and a combination of things along with the TENS to help maintain control.

Midwives affected the participant's control in a positive way by supporting women with TENS and therefore maintaining control of their labour and in a negative way when they did not support women with the use of TENS or their control in labour. Participants that had rapid labours found TENS a useful way of maintaining control by turning the TENS machine up in quick succession. TENS was often the sole form of analgesia for these participants and worked well being used in this way.

Participants who had previous experiences of labour naturally compared their experiences and talked about them. Previous experiences of using pharmacological pain relief affected consciousness and the ability to remain in control and was therefore avoided by many participants in this recent labour and birth. Participants voiced the importance of controlling the TENS machine themselves, however partners often took part in controlling the TENS machine through the participant, who was able to remain in control in this way.

Controlling the actual TENS machine, particularly the 'boost facility' was extremely useful for participants, having 'a box to hold' and 'buttons to press' and physically 'doing something' allowed the participants to focus and concentrate on each contraction.

The home environment affected control and was a positive contributing factor, whereas the hospital environment caused anxiety and loss of control for many participants. TENS enabled participants to remain at home in their own environment for longer during their labour. The environment, partners, family and professionals affected control. For all of the participants being in control positively affected their whole labour experience - 'I had a better experience and felt better about this labour because I'd been in control' (11.8.19).

The findings of the three sub-themes relating to 'control' are all closely linked and form part of the whole labour experience. Control of oneself, the environment and others around the labouring woman affects control. The TENS machine gave women something to focus on and enhanced or improved the maintenance of control of themselves and others. Control, being the super-ordinate theme sits over all of the other themes and is cross referenced in other sections as they are within this section of the findings. The findings from the other themes follow and help us to understand the multitude of factors that relate to control.

4.4 Main theme 1. Supporting the use of TENS

This main theme 'supporting the use of TENS' has three sub-themes which will be presented in order. Firstly 'the midwives' support antenatally', secondly 'the midwives' support in labour' and lastly 'partner's support'.

4.4.1 The Midwives' support antenatally

Women need to feel supported by their midwife in order to prepare for the labour and birth and part of this includes their choices for pain control in labour. The support from the midwife of the woman's choice to use TENS for pain control in labour was articulated by almost half of the study participants. Many midwives discussed TENS at the antenatal classes which seemed to give women the confidence to think about TENS as a form of pain control. 'The midwives talked about TENS as a form of pain relief at the NHS classes' (15.8.40), 'Midwives described its electronic pulses and the theory behind the science bit' (3.5.13). Few midwives discussed TENS individually with the participants. Women do not need 'permission' from the midwife, however for some participants this feeling of needing approval came across and because the midwife had discussed TENS, the participants felt that TENS was worth considering as an option. By talking about TENS it

was felt by some participants that the midwife supported this form of pain control and the information given at the antenatal classes confirmed the participant's decision to hire the TENS machine. 'When I went to the antenatal class and heard the midwife talking about TENS, I thought I'm going to get it' (2.6.17), 'I didn't like it before but after listening to the midwives' talk at the antenatal class changed my mind...I don't think that I probably would have got the TENS unless the midwife had done the talk' (9.9.41).

Conversely for some participants the midwife did not discuss TENS or give any information about it. These participants had made their own choice regarding TENS use and informed the midwife, assertively in some cases that TENS was what they had decided to use. Other participants experienced an indifferent attitude by the midwife and she just assumed that the participant knew what she wanted without any discussion - 'The midwives did not talk about TENS...I told my midwife that I was planning on using TENS' (21.15.16), 'The midwives didn't really comment to be honest' (6.9.30), 'The midwife just assumed that I knew what I wanted' (17.5.35). Retrospectively, these participants sounded disappointed that TENS was not mentioned by the midwife particularly as they had used it. Participants also commented that they were recommending TENS to other women who had also not been informed and therefore did not know about the option of using TENS.

The information women received was very variable and is covered further in section 4.6.1 on gaining knowledge. Information giving was seen as a type of support especially if TENS was the women's choice. For some participants the information that the midwife gave was fused with the TENS hirer's - 'The midwife and the TENS hirer did a lot of in depth explaining' (19.6.6), the participant felt supported and well informed. Others felt that there was a lack of detail and that they would have liked to have known more 'TENS was not mentioned in any detail at antenatal classes' (20.4.28), 'I think that the midwife did show us the TENS machine, but we didn't get the chance to try it or even really look at it' (8.6.17). Conversely, other participants expressed positive comments like being able to try the TENS, for example 'A midwife came in to the antenatal classes and was talking about it as a form of pain relief, she showed us how to put it on and we had a bit of a practice' (18.2.41).

Accessibility affects the use of TENS, midwives had lent the TENS machine to the participants in some cases which was often common practice in this geographical area where this system was available and this will be further discussed in section 4.6.2. Table

4.1 details where women accessed their TENS machines. Again, however the action of the midwife hiring the TENS machine to the participants showed that midwives supported and approved of this method of pain control. An example of this is ‘I think the midwife lent me one of hers last time, then I bought one this time’ (16.6.9), ‘My midwife loaned the TENS machine to me’ (5.2.15).

One participant expressed that she would have liked to know about TENS and hear other women’s experiences of using TENS and highlights ‘If midwives talked about it they could talk about other women’s experiences’ (20.11.5). This participant ended up using her mum’s TENS machine in labour and had not known about TENS until then when her mum suggested it. She used TENS well and felt positive about it and also felt that had the midwives talked about it that she would have been more prepared and hired an obstetric TENS with a Boost button ‘If they had discussed it at antenatal classes, I think that I would have definitely hired one beforehand’ (20.10.1).

This leads on to one participant commenting about midwives’ training regarding TENS and seems positive that her midwife was confident and knowledgeable about TENS ‘I think if they’d given her training on it, they were good to’ (7.8.6). Midwives therefore need the knowledge and experience to enable them to offer support to women antenatally, to offer choice of pain control and feel confident with the use of TENS and its application themselves enhancing their ability to support the women in their care.

4.4.2 The Midwives’ support in labour

Support in labour is an essential part of the care provided by midwives. Providing psychological support, encouragement, good communication and involvement with decision making are extremely important factors contributing to maternal relaxation, allaying fears and anxiety and promoting a good birth experience for women.

Similarly to sub-theme 4.4.1 the participants need support and reassurance in labour and look to the midwife for approval of the use of TENS ‘The midwives were quite happy with it (TENS)’ (17.8.12), ‘I asked her (midwife) if it was alright to put the TENS machine on’ (8.1.28) and some participants expressed their sense of achievement ‘The midwives were impressed I got through it just on the TENS machine’ (19.6.36).

Some participants received support from the midwife with the practical application of TENS in order to ensure that the TENS was in the correct position ‘One of the midwives helped me put it on as mum hadn’t put it on quite right’ (7.2.43), ‘My midwife checked that the TENS was on fine’ (5.3.1), ‘I got the midwife to adjust the pads for me when she came’ (15.4.45). Others found that the midwives were not supportive with the practicalities ‘I think it just came disconnected and they (midwives) said to have it off’ (9.4.14), and this participant sums it up by saying ‘The midwives weren’t 100% supportive of the TENS’ (19.8.9).

Some midwives provided psychological support to participants whilst using TENS, an example of this is ‘I needed to be told I was doing ok, so we rang the midwife’ (13.3.42.), the midwife then visited the woman at home and continued to support her, the same participant then goes on to say that ‘The midwife helped me get my breathing under control’ (13.4.11), she felt supported and in control using her breathing and the TENS to continue in the labour process successfully.

Midwives varied in their confidence with the use of TENS and therefore offered varying degrees of support to the women in labour with regard to the TENS. For this participant who had a particularly knowledgeable midwife this extract summarises her feelings –

‘It was nice that the midwife knew what she was dealing with... I think if I’d had somebody who didn’t know what they were doing I would probably have gone on using TENS ‘not as effectively... I was pleased that she knew what she was doing, that was helpful...she must have used TENS before’ (7.2.45).

Another participant had the opposite experience when a hospital midwife had tried to apply the TENS using two pads only, she was not helpful or supportive particularly as the participant was in pain, the midwife went off to try and find some more pads and did not return ‘The midwife said that she would see if she could get the other two pads, and she didn’t come back’ (20.5.47). Later the participant used her mum’s TENS, which helped however it was not an obstetric TENS and the machine needed to be adjusted with each contraction for it to be effective without a ‘boost button’. The participant felt a lack of communication and support from the midwife with the use and application of TENS, ‘I had that rubbish TENS (incomplete one) at the beginning and the better one during labour (mums TENS)...The midwives took no part in it really’ (20.8.1). This leads us on to an

indifferent attitude held by some midwives ‘The midwives didn’t really comment to be honest’ (6.9.30), ‘the midwives didn’t mention TENS, even though it was being used’ (21.21.16). For these participants the absence of any discussion or communication about the pain control being used could be seen or felt as a lack of support from the midwives.

Even though some of the literature suggests that TENS is only useful for early labour, many participants used TENS all the way through their labours. When the participants had been well controlled using TENS it was unfair to infer that TENS would only be effective or useful in early labour or the first stage of labour ‘My second stage was hard work and that’s when she (midwife) said to take the TENS machine off, she said that TENS wouldn’t really be doing anything for me’ (12.5.21). ‘The midwives just said, consider my other options for pain relief, but I was too advanced (on TENS only)’ (6.9.33), ‘I was continuously asked throughout labour if I was sure I was ok with **just** the TENS machine?’ (19.6.28). The midwives had not appeared to be comfortable with seeing the women in pain and the participants reported that they felt the midwives thought TENS was not enough for the woman’s pain control which in turn had an effect on the participant and her control.

4.4.3 Partner’s support

The theme of ‘partners support’ was present in 17 out of 20 of the participants’ account of their experiences. Two participants had the support of their mothers along with their partners. Partners are often the support person and are much more relied on nowadays than they were in the past. One reason for this is perhaps because often midwives are not able to offer one-to-one care to women in labour with the increased pressure on labour wards today. This support was welcomed by many women who wanted their partner to be involved in their labour and TENS was seen as way of contributing to this involvement and support - ‘I wanted my partner to be involved in the whole thing’ (21.17.2).

Partners have become increasingly aware of non-pharmacological forms of pain control over recent years and have shown their interest and support in the use of TENS as demonstrated in these accounts. Many partners attended antenatal classes with the participants in order to gain knowledge on the available choices of pain relief of which TENS was one option. Participants expressed how keen their partners were on the idea of TENS after the antenatal class - ‘He (husband) had the instructions with him also we saw

the midwife at the antenatal class, so he knew what he was doing' (9.5.5). 'My partner was keen on TENS and was at the class with me as well' (14.7.41). This was also felt by another participant after attending the TENS information discussion at antenatal class with her partner, who says 'Actually it was after the antenatal class when he came in, he was talking about it and said it (TENS talk) was the best bit of the antenatal class' (2.1.27). Antenatal education and information are presented in more depth within section 4.6.

It was difficult for the labouring woman to apply the TENS pads herself, only one woman was able to do this using a mirror. The majority (16 out of 17) of partners took part in the application of the TENS pads on the participants back and ensured as much as possible to position them correctly - 'My partner just stuck the things on the back with the little diagram and he cranked it up' (3.6.18), 'My partner helped put it (TENS) on, I don't think I could get them on without help' (16.1.31), 'I had woken my husband up and said 'could you put my TENS machine on for me?' (6.1.8).

Some partners had applied the TENS before and were confident 'He just kind of put it on, he'd done it before so he knew what to do' (11.6.9). Another participant expresses that her partner and her mum jointly applied the TENS 'Partner helped to put the TENS on, but Mum applied the TENS for me' (20.7.17).

The difference this support, interest and enthusiasm has made for these participants was felt through their comments such as this exemplar -

'My husband seemed really for it (TENS) and said I think that we should give it a go, as soon as he came home he said lets get the TENS machine on, he insisted, and I am glad he did' (9.9.47).

Half of the participants allowed the partner to physically control the TENS machine at some stage during their labour (section 4.3.2), whereas others controlled the TENS machine themselves whilst still valuing their partners support with the use of TENS.

Similarly, another participant received her partner's support in order that she could focus on her breathing and then take back the control of the TENS again -

‘My partner helped control the TENS, he could sort of help, he was turning it up and down, that was quite reassuring, he was doing the TENS and I was doing my breathing, I then took back control of the TENS’ (14.2.44).

For this participant mum provided support by controlling the boost -

‘I handed the TENS machine to my mum and just sort of nodded when I needed it turned up, she was just turning each side up as it didn’t have a boost button’ (7.3.28).

Some partners had the knowledge regarding the benefits of early application of the TENS and encouraged the participants to do this as soon as labour started - ‘My partner helped me and sort of encouraged me to put it on’ (2.2.4), ‘I said its too early, but he said no we are putting it on’ (9.8.22).

Participants commented that the TENS was a distraction (section 4.7) for themselves and their partner and often gave him something to think about, the partner felt involved in the labour and ‘being able to do something useful’ was important -

‘He was turning it up and I was saying ‘yeah, up to there that’s fine’, my husband was operating the boost button because he needed something to do more than anything else’ (10.3.17).

TENS often facilitated an interaction between the participant and her partner with the application and operation of the TENS unit itself, contributing to communication and working together throughout labour ‘there was definitely some kind of interaction between us about the machine’ (13.7.42). Many participants expressed that they worked together well with the TENS, some partners had more input than others but most assisted and were supportive in some way.

4.4.4 Summary of theme of supporting the use of TENS

The midwife’s support was extremely important to the women in this study. Communication and information giving affected the participant’s knowledge and therefore decision to hire and use TENS in labour. Some women commented on the lack of support and the indifferent attitude of the midwives regarding the use of TENS in labour. Varying

degrees of midwifery support were experienced by the study participants from good antenatal education and midwives loaning the TENS machine to the participants to giving no information during the pregnancy or in labour. Participants reported that the midwives that had an indifferent attitude, seemed to lack knowledge, experience and confidence in the use and application of TENS. Midwives who had the knowledge and experience of using TENS showed interest and offered the most positive support in the antenatal period and in labour and indeed promoted TENS as a form of non-pharmacological pain control. Women wanted and valued the midwives' support with the application of the TENS machine and/or confirmation that TENS was applied and positioned correctly.

The partners offered excellent support and were on the whole very knowledgeable regarding TENS. The partners technical understanding, application and interest in TENS was important to the participants and was verbalised in detail. Partners had a positive attitude and were pro non-pharmacological pain control. They were happy to take over the control of the TENS machine if needed or requested to support the use of TENS by the participant. Partners were very much a part of the experience of using TENS, its preparation and use in labour. They encouraged the early application and physically supported the participants with applying the TENS. Partners interacted well with participants, felt involved, included and most importantly they felt useful.

4.5 Main theme 2. Normalising labour and birth

The main theme of 'normalising labour and birth' has two sub-themes. They are 'being mobile' and 'natural and drug free'. Normal childbirth and natural childbirth are often used interchangeably and have been debated for over 70 years now. The British consensus statement (2007) stated that the 'normal delivery' group includes women that start, progress (without drugs) and who give birth, all spontaneously. The WHO defines normal birth as -

'Spontaneous onset, low-risk at the start of labour and remaining so throughout labour and delivery. The infant is born spontaneously in the vertex position between 37 and 42 completed weeks of pregnancy. After birth mother and baby are in good condition...In normal birth there should be a valid reason to interfere with the natural process' (WHO, 1997).

The participants identified that having a normal labour and birth was important to them and the two main factors that promoted this within the study were firstly being able to freely mobilise and adopt postures that they felt they needed and secondly to have a natural and drug free labour, avoiding pharmacological analgesia and the side effects that go with this. Combined these themes contribute to making up the main theme of normalising labour and birth for the participants.

4.5.1 Being mobile

This theme was present in 16 out of the 20 interviews and the majority of participants talked about mobility as being important to them. They describe, along with the emphasis on the 'freedom to move about' and not wanting to be restricted, positions such as kneeling, all fours, rocking side-to-side, standing, pacing around, wiggling, dancing, sitting on the birthing ball, and often a combination of these as labour progresses.

The TENS machines of the present day are small, portable and can be applied whilst the woman is in the upright position. The participants confirmed that using TENS for pain control did not restrict their movement and allowed them to labour wherever and in what position they wanted to. The idea of operating the TENS herself enhances independence for the labouring woman along with being free to mobilise - 'You've got it in your hand, you can wander' (16.8.43), 'The contractions were starting and we just carried on walking... You could just wander round and press it' (15.1.17). Many participants described how they attached the TENS to their clothes using a clip to ensure mobility or they used a neck cord to hang the TENS on.

By being portable, TENS therefore allowed mobility and freedom - 'I wouldn't have been able to go for a walk around the block and clear my mind, without the TENS machine on' (3.3.37), 'I had it with me when I was going up and down and out to the phone, that's the thing with the TENS, you can go anywhere' (16.8.45). Participants describe the ability to be able to do normal things and perform simple tasks easily like going to the toilet without being dependent on others - 'The TENS was not restricting, even when going to the toilet, the whole point of the TENS machine is you can be completely mobile' (21.20.9). Many participants verbalise using a rocking or swaying motion to help in labour whilst using the TENS - 'I kept moving or rocking' (3.1.13), 'I was sort of rocking side to side and had a birth thing, like a bouncing ball, which I could rock on as well' (5.3.9), 'I was mobile

swaying on the edge of my dresser' (21.5.19), 'I was rocking from side to side with the TENS machine on' (18.1.46).

Over half of the study participants made reference to 'the bed', in particular not wanting to be on the bed. Some forms of pain relief such as an epidural or pethidine restrict movement and often require continuous fetal monitoring which usually means being on the bed, however, by using TENS as a form of pain control this was not the case - 'I never actually got on the bed the whole time' (17.10.16), 'I could not have laid on the bed, it was **too uncomfortable**' (21.8.14), 'The thought of having to stay still or lying on a bed or something just fills me with horror' (10.5.22) and 'I needed the mobility and freedom to sort of try and control my pain, rather than to sit on the bed and be strapped to something' (5.6.41).

Mobility and freedom to move here are linked to control (section 4.3) and being on the bed often removes the control for the woman. Being 'strapped to something', was seen as an intervention and is seen to physically inhibit change of position. The 'bed' was therefore seen as negative, apart from one participant who stated that the TENS was helpful in that it allowed her to rest on the bed for a short while in early labour, which she was unable to do without the application of the TENS machine - 'I went to bed with the TENS machine on' (19.2.9).

Women also seem to prefer to deliver in more upright positions and not on the bed as is too often seen in labour wards in main hospital units. Participants expressed wanting to be supported doing what they felt was natural - 'I used kneeling and all fours after my waters had broken' (12.9.7) and this participant delivered in hospital (in a home-from-home room with her community midwife) and verbalises being able to deliver in her preferred position 'She was delivered with me on my knees, leaning against the settee onto the floor' (17.10.18).

The environment was shown as having an effect on mobility, in the home birth setting physical space and the degree of privacy can be addressed, however in institutional settings this becomes a challenge. The labour room is very restricting and women are not free to express themselves in privacy. The freedom to move around, particularly in women's own homes is paramount, offering them the privacy that they need in labour - 'In fact at home I was more comfortable when I was walking around' (12.9.3). It is much more difficult in a main hospital unit, when the woman has only her 'labour room' in which to do this in.

However, one participant describes how she felt confident enough with the TENS machine on that it allowed her to walk to the cafeteria within the hospital site whilst in early labour - 'We went for a walk to the cafeteria' (7.2.47).

Similarly, some participants described an inherent restlessness in labour - 'I was upstairs, down there and all over the place because I couldn't have stayed still if I'd wanted to' (10.5.27), 'I was on quite a high near the end I was just pacing trying to do toilet visits' (5.3.32), and in particular 'dancing in labour', which is often associated with the release of birth hormones namely endorphins -

'I was just marching up and down the house and dancing around in the house, I put some music on and danced about and jiggled, it was quite good fun' (15.14.46).

Entwined with this restlessness in labour is the type of personality of the participant (this links in with section 4.3.1 on control) and is expressed - 'I'm not a sit down person I'm always on the go, when we got to labour ward I was stood up the whole time and sat on the ball and could rock' (9.9.8). Participants described being mobile as helping the pain and a type of distraction, linking in with section 4.7, an example of this is - 'I was trying to walk around a lot during the pain as it helped and took your mind off it' (17.2.29).

The participants had a certain level of knowledge in preparation for childbirth and being mobile was a part of this. Knowledge and information were obtained from sources such as active birth courses, one participant quotes - 'It was really important for me to be mobile, I did the active birth course' (13.4.24), 'We knew that keeping active was quite likely to help' (15.1.12), and 'If you're moving about, you're helping things' (16.9.10). Knowledge and preparation are further discussed in section 4.6.

The freedom of being mobile and facilitating upright positions along with gravity clearly assists in the normal physiological process (Walsh, 2007; Michel *et al*, 2002) and is done naturally by many women in labour and delivery - 'It was really, really, important to be moving round for me, just standing up, keeping upright, makes sense with gravity sort of thing' (15.14.37), 'Being mobile, upright and letting gravity take its course, the upright position encouraged the baby to move down' (21.8.12).

Mobility reduces the need for analgesia (Bloom *et al*, 1998; MacLennan *et al*, 1994; Hemminki and Saarikoski, 1983) and the participants expressed satisfaction that they achieved natural birth without invasive analgesia -‘To experience a natural labour was the most amazing thing that I have ever done’ (6.8.23). Being free to move and change position is of paramount importance to promote normal labour and birth physiology. The participants seemed to intuitively know this which fuelled their search for an alternative form of pain control. They chose to use the TENS machine because it allowed them the freedom of movement and being able to adopt postures that suited them and promoted the type of birth experience that they had hoped for.

The participants had an ‘ethos’ and ‘belief system’ of how being mobile would help the normal physiology of labour and its process. Participants had considered the narcotic effects of other forms of analgesia such as pethidine and an epidural which affect consciousness levels and motor strength and which would not allow them to mobilise and they therefore chose not to use pharmacological forms of pain control for this reason - ‘I didn’t want to be in any way debilitated by any drug type thing’. This leads on to sub theme 4.5.2 which is continued below.

4.5.2 Natural and ‘drug free’

Almost all of the participants expressed phrases relating to wanting a natural and drug free labour and birth (19/20). The participants’ responses highlighted that much consideration had been given to the use of other pharmacological pain relieving options and their thoughts and feelings are strongly documented. Many participants had decided to use TENS for pain control in labour due to its non-invasive and non-pharmacological nature and because it has no after effects therefore the recovery period is not hindered by feeling drowsy or immobile. TENS was seen as much more of a ‘natural’ pain control, particularly useful for homebirths, where the option of having an epidural is not possible. Some participants were planning to use a combination of pain control whilst others considered TENS as a stand alone method. The participants presented collectively as being very well informed about all forms of analgesia available to them, including the side-effects and limitations.

Participants generally had strong views and requested not to have invasive analgesia and over half of the participants verbalised being very much against an epidural for pain relief -

‘I knew that I just couldn’t bare the thought of an epidural’ (10.4.42). An epidural is often seen as leading to other interventions in labour - ‘I was trying to avoid an epidural and I didn’t want intervention’ (11.4.33).

Similarly half of the participants requested not to have pethidine and were knowledgeable about the side effects that drugs such as this could have, previous experiences had affected their views and choices - ‘I had a horrendous experience with pethidine and I could never have it again’ (19.7.31).

It was important to the participants that TENS had minimal side effects -

‘The side effects of TENS are virtually minimal compared to pethidine, epidural and all other drugs, pethidine did have an adverse reaction on my little boy last time, I consciously decided not to have pethidine this time’ (11.10.46).

The non invasive nature of TENS was considered by many of the participants and they put TENS at the bottom of the scale of intervention ‘I wanted as non intrusive labour as possible’ (19.1.9), ‘It was a method of pain relief that was sort of right at the bottom of the scale, I thought it was better to try these things as I’ve got nothing to loose’ (10.4.40).

The participants voiced the importance of wanting a form of pain control that would not affect the baby in any way, particularly not applying TENS to the abdomen- ‘You are not putting it anywhere near the baby, you are putting it on your back’ (11.10.30), they were concerned about the effect of other drugs such as pethidine... ‘Other drugs can make the baby sleepy’ (11.10.49), ‘We did not want pethidine...that goes through to the baby, and can make them drowsy’ (21.14.47), ‘I liked the fact that TENS wasn’t going to hurt her’ (baby) (14.8.30.). TENS was seen as a type of pain control that was ‘on the outside’ and was not something that was being put into the body in any way.

The participants that had a home birth were determined to keep their labours drug-free if possible ‘I was wanting a home birth, my partner wanted me to have pethidine available just in case, I was like...No’ (13.2.28), ‘I had wanted a drug-free home birth’ (15.8.30).

Two thirds of the participants used a combination of natural things, such as yoga, breathing, mobilisation, meditation and water along with TENS, however some participants also used entonox for part of their labour. Many had used entonox just for the

second stage of labour - 'I knew I could just have the TENS and gas and air, because I didn't want to have pethidine' (13.7.50). Of the participants in this study seven used TENS as a sole method of pain control, along with natural methods as mentioned above. One participant verbalises that the midwives' attitude was that TENS was 'only good for early labour' and she had to dissuade the midwives from trying to give her pharmacological analgesia - 'I was continuously asked throughout labour if I was sure I was ok with just the TENS machine' (19.6.28.). Using a combination of pain control that allows the participant to maintain her conscious levels assists with her control as discussed in section 4.3.1.

There was a belief that TENS had the ability to build up the endorphins in order to provide the body with its own natural substances for pain control - 'I was using it in the beginning to build up the endorphins' (11.9.27), 'Putting the TENS on early builds up the endorphins' (21.2.43), 'We heard something about endorphins coming if you use TENS early on' (15.1.23). The boost facility increases the frequency and strength of the electrical impulses during the contraction by pressing the 'boost button'. The feeling is much more continuous rather than a pulsing sensation and this also has the effect of increasing the endorphins and enkephalins which assist in pain relief.

The whole 'ethos' for the majority of the participants was the importance of natural pain control, this became evident in the interviews and the difficulty for hospitals to provide natural pain control in order to promote normality was articulated -

'It would be great to see things like TENS machines and the more natural approaches when you get to hospital...neither my partner, nor I are 'drug friendly' people, I'd rather have everything as natural as possible' (21.23.9).

One participant sums up her feelings with regard to wanting a 'drug free' labour and birth experience -

'I was determined, both last time and this time that I didn't want drugs, I didn't want to be in any way debilitated by any 'drug type thing' ...I was totally against the pethidine, the epidurals all of that kind of thing...the drug-freeness was very important and the fact that I didn't have any or

didn't want any drugs meant that I was willing to give it (TENS) a go'
(6.2.20).

4.5.3 Summary of theme of Normalising labour and birth

Mobility and freedom of movement was very important to the majority of participants in the study. The TENS machine allowed them to have a form of pain control that was small and portable and did not, in the majority of cases prevent them from being mobile.

Participants did not want to be restricted and use 'the bed' and it was seen negatively by most of the participants when in labour. Being able to perform normal tasks and do normal things were of paramount importance. Mobility was seen as reducing the need for analgesia and intervention and therefore maintaining control.

Participants preferred to use non-invasive, drug-free natural therapies and stated that they wanted to avoid the effects of pharmacological pain control and intervention wherever possible. Previous labour experiences shaped participants views, beliefs and expectations which was strongly evident in the data. Participants in this study had varying levels of knowledge but the majority were well informed and had strong beliefs in TENS as a form of pain control that promoted the normal birth physiology and allowed them to keep their labour and birth as natural as possible.

4.6 Main theme 3. Needing to know

During pregnancy when a woman is considering her options and choices for pain control in labour she will need to acquire the knowledge surrounding all types of pain control, conventional and non-conventional, in order to make decisions and choices and state her preferences. There are many ways of acquiring this knowledge, one of which is from the midwife either by offering a woman a one-to-one discussion or by attending antenatal classes. It is the midwife's duty to provide the woman with evidence-based information in order for her to make an informed choice regarding many aspects of care, one of which is pain control. Specific detailed knowledge regarding TENS as an option for pain control and information regarding the practicalities of TENS is a vital part of the knowledge participants need to access, apply and operate the TENS machine successfully.

4.6.1 Gaining knowledge

Knowledge often improves confidence and in turn can affect and improve the feeling of ‘control’ (section 4.3.1), this is expressed by this participant - ‘I felt more in control of the TENS machine this time round because of that little extra knowledge’ (11.9.36).

Almost all of the study participants (19/20) talked about knowledge in some form and many mentioned that antenatal classes were informative and made a large contribution to their knowledge base -

‘At antenatal classes the midwife came and demonstrated the TENS that’s when I understood what it was, If I had missed the antenatal class, I probably wouldn’t have tried TENS...I wouldn’t have known what or where to get it’ (14.7.31).

There is an element of ‘trusting the midwife’, she is the professional and if TENS is important enough for her to mention, then it is perhaps something to be considered as a choice. This theme links with section 4.4.1, when support offered by the midwife involves giving information and participants gaining knowledge at antenatal classes.

It was highlighted by the participants that some midwives fully inform women about their options and what is available to them regarding pain control. Other midwives do not mention or discuss non-pharmacological methods such as TENS and should consider whether they are in fact, giving women enough information and the opportunity to make choices regarding pain control. There was a difference in the amount of information the participants were given, from just mentioning TENS to discussing it in great detail. Many women were undecided about TENS before the classes and were reliant on this information in order to make their decision. It is perhaps midwives that lack knowledge, some do not mention TENS, others only spend a limited amount of time discussing TENS - ‘I think TENS was mentioned at parent craft classes, it wasn’t promoted or anything’ (16.6.26), this suggests that the information may not be substantive as the participant does not recall that it was definitely mentioned.

One participant in particular explains that she - ‘Would have liked more knowledge about TENS...I had never used TENS before...it was just from my Mum that I know about TENS really ‘she uses it’’ (20.10.49). Participants wanted the opportunity to see and try TENS machines and to ask questions and - ‘It’s important to know how to use the TENS

machine to get optimum benefit from it' (19.6.13). Similarly, two other participants who did not have enough information about the TENS machine rationed themselves with its use - 'I rationed myself because I didn't know when the TENS machine would end' (3.4.38), 'I didn't want it to run out of its usefulness before the end of labour' (17.9.15).

The majority of participants were very informed, using different resources to obtain their information in preparation for labour and delivery. The information was often not acquired from midwives and many participants verbalised accessing the information from other sources such as the internet, magazines, books, friends and family, chemists, active birth classes and the National Childbirth Trust (NCT).

Participants used a combination of sources, the following examples demonstrate the variety of these - 'The NCT gave us the information and it was then up to us to make the decision', and 'My friends that had babies had suggested the TENS machine' (21.15.13). Some participants used multiple sources of information including the midwife - 'I'd heard about it at antenatal classes, I'd read about it and my midwife mentioned it...when I was studying years ago I heard about it then, I looked up all the suppliers for it' (4.7.40). Similarly, this participant says - 'I'd certainly read about TENS in magazines, heard about it in active birth and lots of friends recommended it' (13.5.33). TENS is often discussed when methods to avoid intervention are included - 'I went to an active birth class and they were advocating as little intervention as possible...my midwife and yoga teacher gave me the number for the TENS' (10.4.20). The internet is now a useful resource for information - 'I did an internet search, as I couldn't find a leaflet in the chemist...I did look on ebay actually about buying one' (17.4.46).

The participants had varying views on whether TENS should be tried or practised with before labour. Some participants advocated that it was good to try TENS, become confident and familiar with how it works and feels, and prepares them for the sensation prior to labour - 'I think just being able to play with the TENS machine and to know how to set it up before labour was a huge benefit...and having the time and opportunity to experiment and get it in the right position and get used to it' (19.5.33). Some participants practised applying the TENS but did not try it to experience the sensation - 'I practised positioning the pads and pressing the buttons...possibly I should have practised with it more' (14.2.1). Practising with the TENS was often seen as part of the preparation for their labour experience, however the participants needed the knowledge and information in order to do this or even be aware of it.

In contrast some participants were worried about trying TENS and thought that the sensation of it might put them off when they were not in pain and therefore affect the use of it in labour - 'I don't think it would have benefited me to try it before hand... If I'd have put it on before labour and thought 'oh that hurts', it might have put me off' (9.14.8). Another participant shared her views - 'When we practiced we had it on 3 and it felt uncomfortable and not very nice...It could put people off if they try it when not going through any pain when resting' (4.5.23), this participant did however go on to use the TENS as a sole method of pain control, it was her first baby and she applied and increased the TENS rapidly. Some participants who did not try it expressed wanting the TENS in pristine condition and packed it in their labour bag ready for use.

Interestingly, when the midwife encouraged practicing and trying TENS before labour, particularly to build up the endorphins before labour it was much more widely done. If participants did not get this information they were less likely to practice with it - 'We practised using it just a few days before...it would have been like a drama, crisis sort of thing if we hadn't practiced' (4.5.38). This participant who had her first baby at home used only TENS for pain control and expresses - 'I'd sort of got used to the TENS as I'd been using it for 3 days prior to actually going into labour...I knew the machine **very well** by that point...It (the TENS) was no stranger to me' (5.1.16).

A participant that was not given any information regarding the TENS but did use it in labour felt that it would be a good idea for women to try the TENS before labour - 'I think it's a brilliant idea to try it before labour' (20.10.20). Similarly, participants that had used it successfully still felt that they were at a disadvantage not trying TENS before labour - 'I didn't look at the TENS until I went into labour...not practising with it was definitely a disadvantage' (8.1.44).

It has been suggested that TENS is more effective if applied as early as possible in labour, some participants had obtained this information - 'I'd actually put the TENS machine on when I was upstairs, this was as soon as I'd woken up...I'd been told by friends to put it on as soon as possible' (13.2.32). Some participants regretted not putting the TENS on early enough - 'Put it on as early as you can...If I had the TENS on earlier, the contractions wouldn't have been as horrific' (20.11.28). Participants using TENS for the second time were able to reflect on previous experiences with regard to application - 'With my first son I did have a TENS but I don't think that we put it on early enough' (9.5.14), and this participant knew about endorphin production with regard to the early application of the

TENS (discussed in section 4.5.2) - 'Pretty much as soon as I got the first contraction I put the TENS on again, because of the endorphins' (15.4.31).

Previous experience affected the knowledge base of the participants, for example using TENS for other ailments, such as backache - 'The TENS worked well for backache and I hoped it would do the same for labour' (19.1.22), and for some participants knowledge and experience of TENS use in previous labours increased confidence regarding using TENS in labour this time - 'I knew from last time that it had helped' (6.6.30). These participants already had a sound knowledge base and had attended antenatal classes previously - 'The midwives talked about it at classes last time' (17.5.26), 'The first time I tried it before labour...I didn't try it, I just waited this time, I presumed it would be the same as the other one' (16.12.16), 'I tried it the last time before labour because I just wanted to know what the sensation would be' (10.4.14).

Two of the participants had a healthcare background and had both seen TENS used for other types of pain 'I worked at a hospice and a nurse came to pick up a TENS when she was in labour...I have also seen TENS work well with people with chronic pain' (15.8.7), they both talked in depth about endorphins, which shows that they have a good knowledge base 'I knew where to put it because I teach it...I do believe that it does still have an effect on your endorphins and your pain gate' (12.11.21).

4.6.2 Practicalities of TENS

Having made the decision to try TENS, participants then needed to obtain a TENS machine, of which there are various models, some newer and more advanced than others. Access to TENS machines varied considerably, some participants borrowed machines from midwives or friends, some hired the TENS machine from chemists, the internet and local and national TENS hire companies, depending on where the information had been acquired from (see Table 4.1).

Acquiring the TENS machine was part of the preparation for most participants - 'It was one of the first things that I did when I was about 37 weeks, make sure it (TENS) was in the house and all sorted' (10.7.42). This participant was able to borrow a machine from her midwife - 'My midwife loaned the TENS machine to me' (5.2.15). Another participant was loaned a TENS by a friend - 'A friend lent it to me she literally turned up with it'

(8.1.43). Participants needed to know where, when and how to acquire a TENS machine and what the differences were between the machines.

This information gathering and knowledge acquisition was very variable and inconsistent between participants. This led to many different TENS machines being used in different ways. Some participants had difficulty in finding new pads for old machines - 'I only got the pads delivered to me a couple of days before I went into labour' (8.2.11), and others did not have the 'boost' facility - 'I think that they should all have a boost button, it would have been a lot easier' (7.4.8), which was found to be very important and effective by most of the participants who used it (see section 4.3.3 and section 4.7.3).

Access to TENS machines was not equitable for all participants, however, the participants in this locality had many different options available to them including a local hire and TENS manufacturer providing easy access and good information about the TENS machine itself - 'We went straight up and picked the TENS up' (2.1.38).

Cost was mentioned but did not seem to be an issue with any of the participants. It was felt that TENS should be available for women that could not afford to pay for it - 'Cost was not an issue for me but TENS machines should be available to women that cannot afford to hire them' (21.22.45). It was felt by the participants that mentioned cost that TENS was an inexpensive form of pain control and if it did not help then they had not lost anything - 'It was worth hiring for twenty five quid, even if it had not of worked' (21.17.43) and 'Money wise it wasn't that much to loose if it doesn't work' (2.1.35).

Some participants expressed that using pictorial representations were really helpful in the application of the TENS machine and correct positioning of the pads and that all women should be given this form of information - 'The girl that lent it to me drew a back with four squares on and said this is how you did it...I don't know what we would have done if we hadn't had that little picture she drew' (8.6.38), 'The sheet was provided with the information about the spacing apart of the pads' (2.2.12). Having good instruction for application was important - 'The instructions that came with it had a diagram of where you place it on your body' (16.6.46) and the application of the TENS was mainly carried out by the partners (see section 4.4.3), however, some participants were able to apply the TENS themselves - 'I was quite confident putting it on, so I checked it through with the mirror to make sure it was fixed to the right places' (5.1.17). The correct application affects pain control as expressed by this participant - 'I think that if it hadn't been applied correctly we

wouldn't have had such efficient pain relief' (19.6.7). The midwife was often asked to check the position of the TENS pads after the participant had applied it (section 4.4.2). Many participants had practised with the TENS before labour - 'We had practised before just to make sure that the batteries were working and that we had got everything wired up the right way round' (6.7.26) (see 4.6.1).

As participants described TENS machines, it quickly became apparent that TENS manufacturers had taken on board designing machines specifically for use in labour that could be easily transported, being light and easy to carry, had a 'boost' facility for contractions and were simple to operate - 'I liked the TENS unit I chose because it was so small and compact, it was so simple to set up, and the instruction manual was really useful and the diagrams were easy to follow' (21.15.40). 'They are quite user friendly, it was just quite simple' (7.8.42), 'I liked the fact it was lightweight and small' (14.11.15). A participant had used TENS for all three of her labours and expresses that TENS machines have changed over time to suit the labouring woman- 'I would say that the machines seem to have got more sophisticated at each one (birth)' (17.12.44). In addition ideas like a neck strap in order to transport the TENS and to allow hands free if needed was relatively new - 'It came with a neck strap this time, which I found quite handy as I was moving around'. Conversely, another participant that used an older machine voices how she would have preferred to have had a simpler machine - 'It was a complicated TENS, If id had the chance of getting one that was a lot easier then I definitely would have gone for that' (8.7.19).

Interestingly, one participant that had used TENS in a previous labour had not found it effective before, however, found it very effective when used differently in this labour, 'I was one of the 20% that TENS didn't work well for the first time, whereas this time it did actually help an awful lot' (11.4.37). All of the participants in this study who had previous labours (n=7) had used TENS and chose to use TENS again this time. They were confident and inferred that they would not have considered labouring without a TENS machine. Two of the participants had been through labour twice before and both of them used TENS for their previous labours and for this, their third labour. They had previous knowledge and a confidence and belief in TENS. They did not use the same machine each time and discussed why some were better than others and how this made a difference.

For the majority of the participants the wires that connect the pads to the TENS machine were not a problem, however a quarter of the participants found this to be a negative part

of using the TENS machine in labour. They expressed that when moving or going to the toilet the wires got in the way - 'Just trying to change position I actually pulled the wire out and the TENS machine stopped' (9.3.23), 'The wires and things were a bit of a hindrance because I was going from kneeling to standing and moving around that sort of thing' (12.5.27.). Others accepted this and were aware that they needed to be careful with the wires - 'At one point the cable came out and I put it back in' (11.2.43), 'The leads came out once or twice, but you soon realise and just clip it back in' (16.9.20). The majority of women did not see the wires as a problem - 'It all stayed on, I was wearing a sarong and had it clipped onto that, the leads were not restricting at all' (21.20.40).

The participants talked about the period of time that TENS takes to begin to work - 'It probably took about 20 minutes to actually start to have an effect' (12.3.39.), 'It did take about half an hour to kick in, but it did help' (11.7.23). Most participants agreed that this was the average time for TENS to take effect.

Some participants expressed keeping the TENS on after the birth for pain control whilst delivering the placenta or having stitches. 'The TENS helped whilst they were checking to see if I needed stitches' (4.4.6.). Other women simply forgot that it was on - 'I still had the TENS on after, because I had forgotten about it' (17.3.42.).

For one participant the versatility of TENS was expressed when she removed the TENS to enter the birthing pool, and then got out of the pool and wanted to reapply the TENS - 'I got in the pool and contractions disappeared, so I got out and stuck the TENS on again' (15.5.15). TENS can also be stopped and taken off at any point without any difficulty and re-positioned and re applied at any time.

4.6.3 Summary of theme of Needing to know

Knowledge needs to be acquired in order to make informed choices for childbirth. Historically, the mother or the family gave advice to the pregnant women, following this the midwife then became the main source of giving advice and information. Nowadays, women are much more confident to search for information and many often use a combination of sources to obtain knowledge. Families and social networks have been shown to influence their choices and contribute to knowledge. Antenatal education is still vital and many women rely on midwives to give information and evidence and many of the

participants in this study would not have known about TENS or indeed tried it without attending these sessions. This study has highlighted however, that even though some midwives provided excellent support and were knowledgeable regarding TENS, many midwives lacked knowledge and experience of using TENS and therefore could not impart information to women or indeed do not have the confidence to support the women and their use of TENS in labour.

This information is not equitable or indeed standardised and varies between localities and across the midwifery service. The level of information and communication regarding TENS was also identified as varying considerably. Equity of access to TENS machines was not consistent, along with the machines being of varying age and modification. Participants confirmed that they 'needed to know' that TENS was available to them, how to access it and how to use it for it to be successful. The practicalities were important to them and particularly knowing that they could hire a TENS specifically designed and intense enough for labour with the 'boost facility' to support them through contractions and knowing that practising with the TENS prior to labour was an advantage. The correct application is vital for midwives to be aware of in order for them to impart this useful and necessary knowledge to women.

Despite the lack of knowledge that some women had, they still hired, bought or borrowed TENS machines for use in labour. This suggests that they were keen to try non-pharmacological, non-invasive pain control such as TENS for labour and birth and searched for the information to allow them this option.

4.7 Main theme 4. The distraction from pain

The distraction from pain was very prominent in the participant interviews. Distraction was verbalised differently for each individual participant although similarities or commonalities between the cases were found. The sub-themes 'security feeling', 'distraction by TENS' and the 'physical sensation' all contribute to the whole distraction from the pain.

4.7.1 Security feeling

Feelings of security are linked with distraction but also affect control (section 4.3.1). A third of the participants (7/20) talked about feeling ‘safe’ and that they had a feeling of ‘security’ when using the TENS machine in labour and for these particular participants this was important. For two of the participants this was their first labour and the remaining five participants this was their second or third labour.

The TENS machine provided something to ‘hold’ or to ‘have in the hand’ as participants express - ‘It was almost like a security thing, I always had to have something almost to hold on to ‘that security thing’’ (2.4.18), the boost button which was seen as contributing to control (section 4.3.3) and part of the TENS machine acted as a distraction and security - ‘I had the boost button in my hand that was my security’ (10.6.33), and ‘It feels like security as well’ (9.7.3). The security of having something to hold on to therefore proved to be a distraction for these participants.

In particular for these participants it was important that TENS felt safe to use - ‘I felt really, really safe’ (15.3.19). TENS was described as providing a comforting feeling that contributed to feeling safe - ‘It was a really comforting feeling that made you feel safe’ (3.4.12). Participants became attached to the TENS because of feeling safe and secure - ‘I do think that you get quite attached to it, I didn’t want to take it off (17.10.28). For one participant using it for the second time increased these feelings, she describes being more confident and more in control of her labour -

‘This time it felt much more safe and secure...If I have the TENS, it will give me something that’s perfectly safe to use...Its very, very safe, that is something that made me want to use it...I felt quite safe and happy with it as you’re in control of it’ (11.10.50).

4.7.2 The Distraction by TENS

The TENS has been described by over half of the participants in the study (12/20) as acting as a distraction from the labour pain. From these participants there were however over 120 phrases relating to distraction. By physically operating the TENS machine, it was possible to divert the woman’s attention or take her mind from the pain of the contraction. TENS

also allowed concentration, promoted calmness and was often described as ‘blocking the pain’.

This participant describes the diversion from the contraction pain by the actual feeling of the sensation of TENS and how this helped ‘My brain was thinking about the sensations on my back, rather than thinking about the contraction pain’ (21.18.49).

Similarly, being distracted from the pain and being able to focus at the same time is important - ‘It (TENS) distracts you when a contraction comes along, it just gave me something to focus on’ (15.9.17). This participant highlights that TENS is seen as a form of pain control, the distraction was more important than complete pain relief -

‘You’re just in your zone, and want to concentrate on anything that’s going to distract you from the pain...it actually calmed me...I thought it (TENS) was more of a distraction for me than pain relief...I would use it again for the distraction of it’ (18.4.2).

Being absorbed into one’s self or being in your ‘zone’ was also verbalised by another participant who was able to concentrate and maintain control through distraction -

‘I was in a ‘zone’ and just thought I’m just going to keep going, there were other distractions such as my mum, the TV, my partner, but none of those had the same effect as the TENS...I think the whole distraction thing is a massive part of it’ (12.10.11).

TENS is perhaps a distraction from the progress of labour - ‘You’ve got some kind of distraction to what’s actually going on inside your body’ (10.2.31), ‘I could think about something else other than the pain in my tummy and what was going on there’ (5.2.39), ‘I was concentrating on what was going on, on my back rather than on my tummy’ (7.4.19).

Concentration was another important factor that links into control (section 4.3.1), however it is also seen to support distraction - ‘It was more of a distraction, it helped me, ‘something to concentrate on’ (4.4.14), ‘Its almost as if you’ve got something else to concentrate on rather than the pain (2.3.46), ‘The surround sound of people around me went as I was just concentrating on the TENS’ (5.3.13).

Participants talked about diverting attention through operating the TENS machine -

‘It took a little while for each one, each dialling up to feel comfy, would be noticing the TENS rather than the contraction... As soon as the TENS came off, I just noticed the difference, I thought well that’s got to be doing something’ (15.13.21).

Movement and breathing techniques could be combined with the pulsing of the TENS machine - ‘I would sort of sway my hips left and right with the pulse and breathing in and out with the pulse’ (14.16.17), similarly ‘I think with moving around, the TENS and the distraction of pressing the booster button’ (10.2.7), the TENS machine is therefore used within a combination of things to provide a distraction from the pain. Many participants felt that ‘just having something to do’ like operating the machine was enough in itself - ‘I think it probably did give me something to do’ (17.7.2). Whether the TENS is seen as psychological here is again considered - ‘You’ve got a little bit of control over something whether its psychological, I don’t know, but I didn’t care, I had the button to press and something to look at and breathe with’ (14.15.26) and ‘I think psychologically, even just putting the TENS on had an effect as I thought ‘help is on the way’’ (12.9.44).

One participant commented that meditation is now becoming more popular and she had prepared herself by doing a meditation CD - ‘I’d already done a meditation CD and that was my plan for the birth ‘to meditate’’, she coped well in this, her first labour and used TENS as part of her meditation using its sensation -

‘I’d heard about meditation for the labour so that’s what I did, every time the TENS machine was buzzing, I just kept telling myself that ‘the pain won’t last’, I was just literally concentrating on the TENS machine going ‘bob’, ‘bob’, ‘bob’ and putting this sensation through me, it is the hypnotic sort of sensation that you don’t get from anything else’ (4.7.7).

Whether due to the hypnotic sensation, the meditation or simply the distraction she also felt that the TENS machine was blocking the pain for her - ‘If I had pain then the TENS machine must have been blocking it because I didn’t feel anything’ (4.3.39). Similarly, other participants felt the same - ‘I think because I’d managed to get it to such a high level it did block out a lot of the contractions’ (9.11.39). ‘It almost felt like it was sort of mesmerising me’ (7.4.15). Another participant used praying with the TENS throughout her labour (section 4.3.1) and this was seen as another type of meditation or way of coping for that particular participant.

Many participants made reference to ‘the mind’ and ‘taking my mind away from the pain’, this was often quoted as being the view or experience of many of the participants - ‘I think in my mind I knew I was sort of having some pain relief’ (16.13.41), ‘It (TENS) gave me something to take my mind away from the pain of the contraction and concentrate really well’ (21.19.8). This participant relates to her mind and body being on different levels - ‘My body’s on a level and my mind’s on another, I can cope, I control and then the contraction subsides’ (11.2.20). Lastly, this participant verbalises how the mind and distraction are linked - ‘It kind of took my mind off what was going on at the front and helped the pain as well, it was working in two ways, its just about distracting yourself, taking your mind off it’ (15.13.1). TENS was seen as ‘masking the pain’ for a third of participants, examples of this are - ‘I would actually say it (TENS) was masking the pain’ (20.6.42), ‘I was actually in a lot more pain than I realised at the time (with the TENS on)’ (8.7.43), ‘All I could feel was the TENS machine and not the contraction’ (7.4.18), ‘As soon as the TENS came off I thought that actually really hurts and that was what I expected labour to be like’ (15.2.21).

The TENS also allowed the participants ‘space’ - ‘The TENS was letting my brain think, TENS allows you to step back and see the situation’ (3.3.4), another participant retreated into her shell - ‘I went very insular and I couldn’t really think about anything, I was in my little shell’ (4.6.23) and this allowed the participants to become detached from what was happening for a period of time - ‘It was that kind of ‘space’ and was not quite ‘feeling’ in my body, you knew there was a sensation there, but you were kind of removed from it’ (13.5.14), and ‘I disassociated myself from my body, you kind of have that floaty point’ (11.2.17). These were all ways that the participants described as distraction from the pain of the contractions whilst using TENS, this contributed to their being able to cope and adding to their positive experiences of labour.

4.7.3 Physical sensation

The physical sensation of the TENS machine was extremely important and was raised by all 20 of the participants. TENS was described as something that you need to get used to, practise with and find the right settings for each individual. The TENS was described as needing to feel comfortable. ‘After a while you get used to it, I actually found it quite comfortable, giving you relief to your lower back’ (5.2.37), ‘I was very comfortable with it on, I thought it really took the edge off, I didn’t find the TENS uncomfortable at all’

(4.4.26), 'It was quite a nice sensation, I tried upping it, but the sensation was not comfortable' (21.19.2). This participant sums it up by saying - 'If its not comfortable then its not really going to help you, I believe that the TENS has to be comfortable to get the benefit from it' (12.3.37), 'It was very much more comfortable pain' (with the TENS) (6.5.46), 'You want it to be at a comfortable level' (11.6.39).

Some participants were able to comment on the use of different machines and some were more comfortable than others - 'I didn't raise it up very high as it wasn't as comfy as the one before' (16.3.41). Others supported this and found that if turned up to high the TENS became uncomfortable - 'When it was turned up too high it was an 'uncomfortable buzzing', and 'if I turned it up higher it started getting uncomfortable with the tingling' (15.6.10). A small number of participants felt apprehensive about what the sensation would be like - 'I was really scared because you just don't know what its going to feel like' (2.1.43).

All the participants gave explanations (182 phrases) of how the TENS felt on their back and the need to work with the TENS - 'It was the most bizarre feeling, the pulses were sort of Zingy, if I had allowed myself, they could have been very irritating, I just worked through them rather than against them' (2.2.35). Similarly, 'It just feels like there's just a slight buzzy feeling, but if you get it wrong it's quite unpleasant' (11.6.32).

Some participants actually described the little electric shock feeling that TENS can give, especially if it is turned up too high. Modern machines seem to be more powerful to cope with the contraction pain for the labouring woman, however the TENS needs to be gently increased to prevent the sensation from becoming uncomfortable - 'I couldn't believe the electric shock kind of feeling, its zapping you, I got a little jump' (16.12.29), 'If I turned it up too high it gave me little jumps like an electric shock' (15.12.37). This participant was really excited about the feeling -

'It felt like I was doing the rocking or the movement, but it was the TENS instead of me physically doing it, It feels like there are two little feet or four little feet jumping, electricity is working really well' (3.4.1).

Other sensations are described - 'It is an odd sensation, it was like a tingling sensation' (6.7.36), 'I was almost sort of waiting for the next buzz to happen and it was almost like tingling, it was quite nice' (7.6.16), 'Its sort of like a prickly sensation' (5.2.36).

The sensation was often likened to a massage - 'It was almost like a massage, so it was nice' (18.6.21), 'I got this really nice sort of massaging sensation in the back' (21.19.42), 'It was like having the most lovely massage ever, just up and down your back, from the inside, not the outside' (3.6.21), 'It was just like having a really pleasant sensation in your back' (13.4.46). 'When I took the TENS off I realised how helpful it had been' (15.2.12), this participant felt the difference once the TENS had been removed or turned off, similarly another participant articulated missing the sensation -

'He literally turned it off, and I had a contraction and then I said 'No, ok turn it back on!' that's the reason that I knew that it did actually help because I was so, so convinced that it was doing nothing at all' (6.6.33).

The 'Boost or burst mode' is mentioned due to the sensation of it being different, it is continuous rather than a pulsing sensation, many participants preferred the feeling of the TENS when the TENS was in the 'Boost mode'. (The boost is discussed further in section 4.3.3). 'I preferred the burst sensation, than the pulsating, I kind of enjoyed waiting for a contraction to come as I could press the burst and got this 'nicer sort of sensation'" (21.19.21). This participant requested that TENS be available with a 'double boost' mode for when contractions are really painful - 'I was wishing there was a double burst mode on the TENS' (21.6.24), this extra boost facility is however now present in some of the recently designed TENS machines. The boost is summed up by these two participants and they both highlight how important having this option was for them -

'With the boost, the different sort of vibrating pulsation on the back affected the amount of pain relief it delivered, the sensation felt different on boost, the boost made me feel more comfortable when I was in strong advanced labour' (19.5.7),

'I used the booster button during every contraction, brilliant, the whole thing for the 'boost thing' for the contractions was brilliant, if the pulsating bit in between isn't really working, then it doesn't matter, so long as the 'boost' worked' (17.4.40).

The strength and levels of the TENS machine were expressed by many participants in the study - 'It did feel very strong and it was enough' (6.2.28.), 'It is a real shock to the system, but using it gradually is fine' (5.5.48), 'I was quite shocked at how strong it was when you first went up the next level, it was almost 'oww' and then you got used to it and

it was alright' (8.2.23). 'There is a bit of discomfort from the TENS and some people can't take it, its really funny but when you've actually got that pain you are trying to counteract it, I think my sort of body was sort of 'pulsing quite strongly' (4.9.19), 'Its really sort of pounding its painful almost on the back but you are sort of craving that pain to get rid of the labour pains' (9.2.50).

Participants felt that the TENS was so strong that it may have been possible to see it working or perhaps that the feeling would continue after its removal - 'You could feel the pads almost working, I asked my partner if you could see them moving on my back' (3.6.42), 'I asked if I was going to feel this sort of feeling or pulsing after it (TENS) comes off' (2.7.23).

4.7.4 Summary of theme of The distraction from pain

Many participants in the study described how useful TENS was as a 'distraction' from the pain. Psychologically, for the participants having something to do or having something to hold on to contributed to feelings of safety and security and it took their mind away from the intense pain of the contractions. The physical sensation was commented on by all of the participants and was described in many different ways. TENS produced a pulsating feeling and a continuous boost from the machine which needed to be comfortable and at the right level for each participant. The participants' experiences varied and some were negative, particularly if the TENS was turned up too high, this was able to be rectified by adjustment of the TENS machine levels, but having this knowledge and awareness is vital for TENS to be successful. However, the sensation is described as individual but feeling comfortable is paramount. The newer TENS machines were noted to be easier to operate, adjust and control.

TENS was seen as 'masking the pain', 'blocking the pain', and allowing 'space' to maintain calmness, confidence and a sense of control. TENS was used throughout labour, not just for early labour as recommended by guidelines (NICE, 2007a), and it was used for pain control in strong advanced labour by some participants. Participants found this distraction from the pain to be extremely helpful in dealing with labour pain and it has improved the overall birth experience for them. The distraction element of TENS has been mentioned before in the literature but I feel that it has been underestimated in the past.

4.8 Main theme 5. Trusting in TENS

‘Trusting in TENS’ is the last of the main themes being presented in this Chapter. It has two sub-themes, ‘believing in TENS’ and having ‘confidence in TENS’. Phrases relating to the birth experience of each participant, future use of TENS for the participants and recommendations to others are included. In order for participants to trust in TENS they needed to feel supported, be in control and have knowledge regarding TENS use in labour. Positive support offered by the midwife by providing information on the use of TENS in the antenatal classes and in labour, particularly for participants having their first baby influenced the degree of trust in TENS and affected their beliefs and confidence.

4.8.1 Believing in TENS

Participants (11/20) talked about ‘believing in TENS’, some from previous experience and having been through labour definitely made a difference to their beliefs. Their expectations were more realistic, an example of this is -

‘If you don’t think its going to work, then its going to be a complete waste of time...I knew that it had helped me before...I believed in it after last time...I had total confidence in the fact that it was going to at least help me through...It (TENS) was obviously not going to take the pain away completely...thought, well let’s give it a go, let’s see if it does its stuff like it did last time...and it did’ (6.3.2).

Believing in TENS was definitely important and seemed vital for it to work properly.

Participants that had used TENS for all three of their labours had a strong belief system and both felt that it had been more effective with each labour - ‘Maybe it’s just a case that we believe it’s giving you pain relief and it’s working, with each subsequent birth I found the TENS more effective with each one’ (17.6.35).

The idea of TENS being non-pharmacological and non- invasive and allowing normal birth processes to be promoted was part of the ‘idea or ethos of TENS’ that was felt by many participants. This idea of TENS was embraced by some participants - ‘I always had it in my mind that I would use TENS, I had kind of gone with it from the beginning’ (15.8.46), and the philosophy or ethos is verbalised - ‘I think the TENS machine worked really well with that sort of ‘idea’ or ‘ethos’’ (4.2.49).

Participants used positive phrases that showed how much they valued using TENS and how much it had become a part of the experience for them - 'TENS had just been a whole part of my labour' (7.9.14), 'It was like a part of me' (4.4.18), 'I think that the labour was so much better because of the TENS, It was a life saver' (20.11.21), 'Oh my lord, electricity is brilliant' (3.6.2), and 'I was feeling very positive about the whole TENS experience' (19.1.24).

4.8.2 Confidence in TENS

The confidence that the participants (15/20) had in the TENS machine was shown by how they spoke about it so positively and the fact that they would use it again in future labours and would definitely recommend it to others and in fact already had by the time they were interviewed. If TENS had not been effective and worked for them, they would not have wanted others to try it.

Two of the participants who were healthcare professionals seemed to believe that their knowledge gained through their profession helped them to believe that TENS would work, they had both witnessed the effectiveness of TENS in their patients - 'My knowledge base through work is why I felt confident in its ability that it would help me' (12.8.43), 'I have also seen TENS work with people with chronic pain...I've always known about it...I always had it on my mind that I would use TENS...I liked the sound of it, it just makes sense' (15.8.48).

This participant voices the openness expressed by many participants to try TENS and to just see what happens - 'I was of the view that I would just get it and see what happens...If I have it on and it doesn't work, then I've not actually lost anything' (10.4.25). The participants have the confidence to adopt this positive attitude and being relaxed about this type of pain control enhances its use.

Confidence was improved (section 4.3.1) by being able to feel good about oneself which in turn affects trusting in TENS. TENS positively supported participants - 'Every time I got through a contraction I felt good about myself' (9.5.35). Having this confidence and trust maintains calmness and control and allows the TENS to work better - 'I was absolutely convinced the TENS would work, so that probably made it work even better' (15.12.2), 'I was confident with the TENS being enough pain relief' (21.5.44).

This strong faith and confidence in TENS was present for most participants - 'I had a lot of faith anyway that TENS would work for me, I never had any concerns about the TENS working, I knew it would work, in my head' (15.11.37) and 'Using TENS seemed to be part of the package for me, that's how I imagined the whole thing to be really' (10.7.49).

Over two thirds of the participants in this study have made reference to using TENS again in future labours (70%). The participants said with confidence that they would definitely use TENS again, and some commented on using TENS as early as possible. This highlights that the participants mainly had positive experiences and even though there could have been improvements made in some aspects of support, knowledge and care that the participants received, they still valued the use of TENS enough to feel confident enough that it would work as well in subsequent labours. It is important to note that the remaining one third of participants did not make any comments.

The following table (4.6) shows some of these positive phrases relating to the future use of TENS -

Table 4.6 Phrases relating to the use of TENS in future labours

Participant number	Verbatim phrases
(10.7.38)	'I would definitely use TENS again'
(19.7.49)	'I wouldn't hesitate to have another TENS birth'
(4.9.14)	'TENS would definitely be what I would use again'
(16.10.38)	'I would always ask for it (TENS) now'
(8.5.46)	'I would use it again, it was definitely useful'
(7.5.3)	'I would definitely do it again and I would definitely use the TENS machine, next time I'd just use the TENS machine and get on with it'
(5.5.38)	'Now having used it once I would definitely use it again, over anything else'
(13.8.32)	'I'd just stick it on right at the beginning, I wouldn't even think twice about it'
(21.21.35)	'If I have another baby I would certainly hire a TENS again and would use it from the early stages of labour'
(18.7.23)	'In future, I would slap it on straight away'

After successfully using TENS in labour, place of birth was commented on by many participants, one participant's success with TENS enabled her to hope for a home birth next time - 'If TENS would work as effectively again, I would consider a home birth just using TENS' (19.8.14). Some of the participants felt confident that they would not need any further pain control after having this experience.

Most of the participants verbalised their experience of labour and how TENS without any side effects, promoted normality - 'We came home 3 hours after he was born' (9.5.49), participants felt well, pleased with themselves and happy that they could be at home with the family as soon as possible. The following table contains examples of the overall birth experience for these participants and the positive attitude that these phrases display.

Table 4.7 Phrases relating to the birth experience

Participant number	Verbatim phrases
(15.9.45)	'It was actually a really nice experience'
(6.8.25)	'I didn't believe it would be as enjoyable as it was'
(18.5.39)	'It was a really lovely experience'
(21.13.29)	'I enjoyed the experience of giving birth'
(19.8.8)	'I couldn't have asked for a better labour, I had a very positive birthing experience'
(7.5.27)	'I want to have another labour because I enjoyed myself, It was just a nice experience'

Over half of the participants talked about recommending TENS to other women due to their positive experience of using it for pain control in labour. Some participants expressed that they would also recommend TENS for women that preferred to stay at home for longer during their labours even if planning a hospital birth -

'I would recommend TENS to anybody to use just purely because I mean I wouldn't have got to 8 centimetres dilated at home if I hadn't had TENS- No way' (12.10.24).

The table below shows examples of the recommendations for using TENS in labour -

Table 4.8 Phrases relating to recommending the use of TENS

Participant Number	Verbatim phrases
(7.5.23)	'I would definitely recommend using it, it was a great help'
(21.22.24)	'I would certainly recommend TENS machines'
(6.3.46)	'I'd recommend it to anybody, no matter how far advanced you are'
(15.15.40)	'I have already talked a couple of people into trying it'
(12.10.26)	'I would definitely recommend it to people, so that you can sort of labour as much as you can at home'

4.8.3 Summary of theme of Trusting in TENS

Previous experiences have been shown to increase trust, belief and confidence for many of the participants. Over 70% of women said they would definitely use TENS again in future labours which is significant. It is important to note that the remaining participants did not say that they would not use TENS again, they had just not verbalised this either way.

More than half of the participants would and some have already recommended TENS to others. After using TENS for pain control in labour positive labour and birth experiences were commented on by the majority of participants in this study, this highlights the value of this mode of non-invasive analgesia and the contribution that it has made.

The majority of the participants acknowledged that this trust, belief and confidence in the use of TENS were enhanced by the midwives offering support by informing them about TENS as a choice of pain control at antenatal classes. This was particularly true for women having their first babies who did not have previous experience to give them confidence. If support was given by the midwives with the use of TENS in labour this also boosted confidence levels.

‘Trusting in TENS’ was vital for the success of TENS and for its helpfulness for women in labour.

4.9 Key points of findings:

- ‘Control’ and its multi-faceted dimensions have a huge effect on women in labour and TENS supports the maintenance of internal and external control by operating and using the TENS machine in labour.
- Support of the midwife is vital in the antenatal period by supplying the woman with accurate evidence based information and an informed choice of pain control and in labour with the use and application of the TENS machine.
- The partner’s role is highlighted as being much more prominent than in the past. The support and interest in using non-pharmacological analgesia in order to promote normal birth is being expressed and encouraged by partners.

- The information given by midwives is not equitable across the midwifery service leaving women to acquire the information from many other sources.
- Some midwives lack the knowledge and experience of using TENS and cannot therefore support women appropriately with this choice of pain control in labour.
- The detailed application, operation and physical sensation of the TENS machine is highlighted as being much more important than previous studies.
- Promoting normality is important to women, particularly being able to be mobile and use drug-free pain control that does not adversely affect themselves or the baby.
- The whole ‘ethos’ of TENS has been highlighted and having a trust and belief system that supports this philosophy is expressed.
- TENS has been shown to be a distraction to women in labour as well as providing a feeling of safety, both which support their control in labour.
- Women have expressed how their faith and confidence in TENS has enhanced and promoted a positive ‘birth experience’.
- Women have very ‘powerfully’ expressed that they would definitely use TENS again in subsequent labours and have already recommended it to others.

4.10 Summary of findings

The findings of this study have allowed a much deeper insight into what women’s experiences of using TENS for pain control in labour are and support the need for this in depth rich information. The themes in this study have identified what is important to women and why this matters to them. The themes have orientated the forthcoming discussion towards promoting ‘normal birth’ and the factors which contribute to and support the woman with this.

The super-ordinate theme of 'control' described as 'coping with' and 'being in charge of' by the participants is pivotal to the other main themes and sub themes and affects the whole experience of childbirth. The multi-faceted dimensions of control include internal control of one's self, women's control of others and the surrounding labour environment along with physically controlling the TENS machine. Being supported in the use of TENS affected control and its maintenance. Midwives were often supportive in giving detailed information on the accessibility, use and application of TENS, but it was frequently expressed that some midwives lacked knowledge and experience in the use of TENS and were unsupportive which removed the control from the woman and had a negative effect.

The partner's role has developed hugely over recent years. Partners are much more interested in the prevention of intervention and promoting normal birth by using non-pharmacological pain control. Partners offered support in the use and application of TENS and they were instrumental in its success.

Being mobile and not having to use pharmacological pain control because of the affects on themselves and their babies were both important to women. Women were aware of the improved recovery period for themselves when using non-pharmacological pain control and the effect of narcotics on their baby which encouraged them to seek alternatives for use in labour.

Knowledge and information regarding TENS varied considerably. Women accessed information from multiple sources. Midwives gave comprehensive information and evidence-based information to some women however others did not receive any information on TENS at all. As identified midwives often lacked knowledge themselves which left women to investigate their choices from other sources. Friends, family and the internet provided information on the use of TENS in labour.

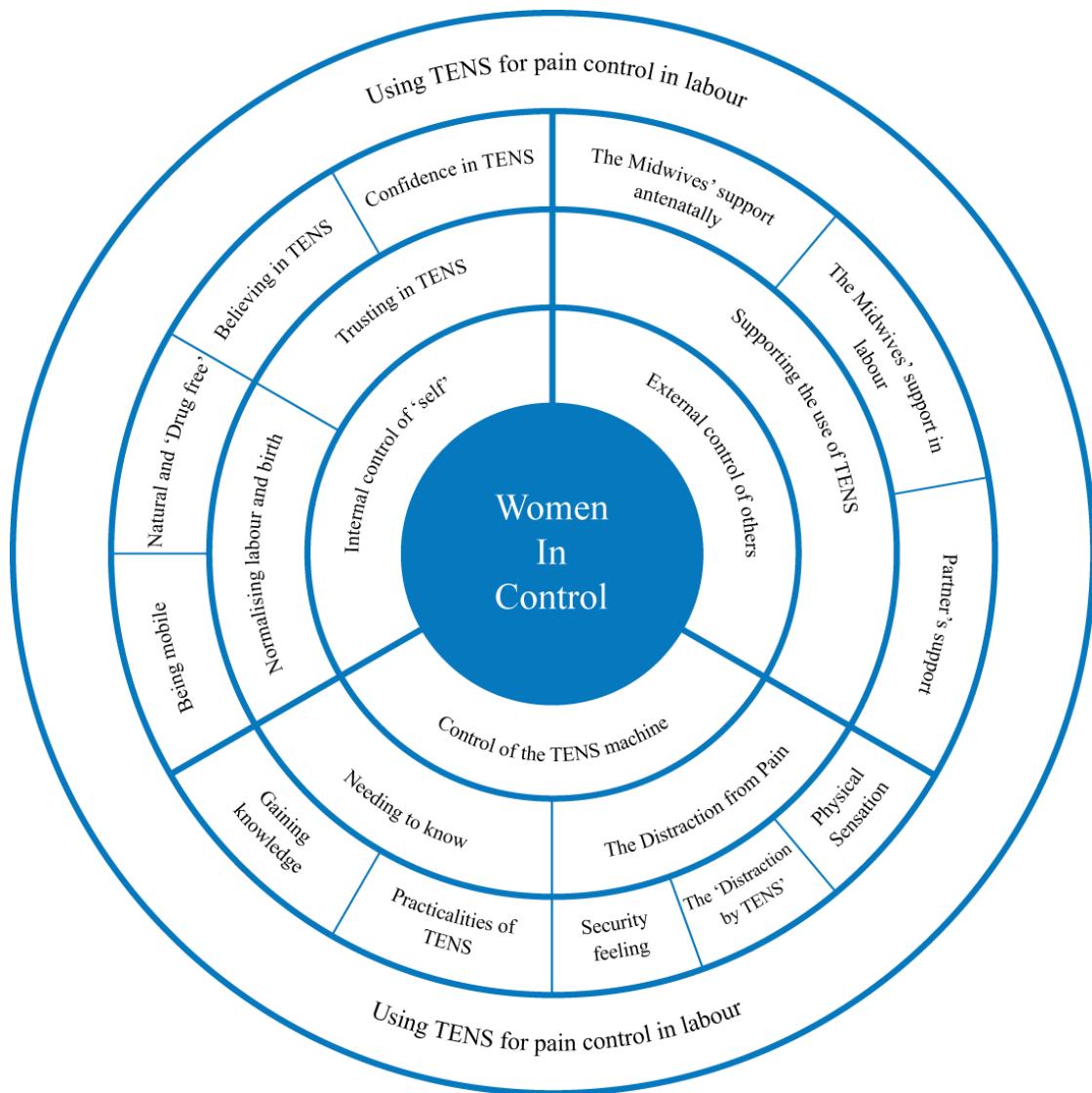
The research study has found control to be a prominent feature of women's experiences of using TENS in labour (see figure 4.1). The women in this study provided a very detailed account of how they used TENS in labour, what was useful and what was unhelpful. This account begins to explain why TENS has become increasingly more of a popular and useful choice of pain control for labour. In the next Chapter I will discuss these findings in relation to the literature.

5.1 Introduction

This penultimate chapter of the thesis will discuss the findings presented in chapter 4 within the context of the available knowledge. The discussion will draw on previous research studies included in Chapter 2 as well as those related specifically to the themes that have emerged in this study to illuminate and contextualise the findings and create the discussion. Although the discussion will include the themes and sub-themes detailed in Table 4.2 the super-ordinate theme – control – has been given primacy. Control acts as a magnet pulling together all the other related themes and as such emphasises the inter-relatedness and inter-dependency of all of the themes (Smith *et al*, 2009). This connectedness makes it hard to separate the themes since they coalesced for the women during their complex experiences and in their accounts of TENS during their pregnancies, labours and births. The main themes and the sub-themes will now in this discussion therefore be inter-woven within the three areas of control. Finally, I will draw together the salient issues that have emerged in this chapter in preparation for the identification of recommendations for practice, education and research in the closing chapter.

After consideration of the findings and the emergent themes from the study Figure 5.1 was designed to represent women's experiences of TENS for pain control in labour. Using TENS for pain control in labour can be seen in the outer circle encompassing all of the themes. Working inwards the sub-themes sit within the next layer being drawn together to form the main themes situated beneath. The main themes were then naturally drawn into the three dimensions of control which the segments demonstrate – internal control of self, women's external control of others and control of the TENS machine. Finally the woman and her control sits at the centre or the core of the whole experience of using TENS for pain control in labour. I will refer to this figure throughout this chapter in order to remind the reader of the inter-relatedness and inter-dependency of the themes.

Figure 5.1 Women's experiences of TENS for pain control in labour



I will firstly, but briefly introduce control in childbirth. Then, in order to set the discussion chapter within the context of midwifery, I will re-visit the two different paradigms or belief systems underpinning midwifery care that were identified in Chapter 1. These are the medical and the natural models of care that affect control and choices of analgesia in labour. I will revisit in the light of the results, the literature on TENS and control presented in Chapter 2 and refer to it throughout this chapter. I will focus on the three sub-themes that make up the super-ordinate theme of ‘control’: firstly, internal control of self, along with normalising labour and birth and the woman trusting in TENS, secondly, women’s external control of others and the environment which is closely linked to supporting the use of TENS and lastly, the control of the TENS machine which encompasses needing to know about the TENS and the distraction from pain. The sub-themes are included and discussed within each relevant theme however, some themes overlap reflecting the experiences of women in labour in this study.

5.2 ‘Control’

Childbirth is a unique event in a woman’s life and like other important achievements in life, the hard work of labour is normally followed by exhilaration, and pride in one’s accomplishments of a most challenging task. The amount of satisfaction a woman experiences with her labour appears largely to be determined by how much she is in control of her childbirth. Childbirth is an experience that has far-reaching potential for affecting the mental and social health of women and family members and has meaning far beyond the physiological processes that occur. Creasy (1997) supported this and emphasised the importance of health care professionals whose goals should be to enhance the patient’s control of feelings of mastery and accomplishment in labour.

For many years now there has been a broadly held view that many women prefer to hand over responsibility for their care to the professionals who are looking after them and do not wish to take an active part in planning their care or making decisions about it. Alongside this view is a growing acceptance that other women will want to be fully informed and in control of their care. This is reflected in current policy (Maternity Matters, 2007) in order to provide this choice for women. These are usually thought to be better educated, more articulate and, by definition, middle-class women (Green *et al*, 1998).

There are therefore two clearly different paradigms or belief systems held within midwifery care that affect choices of analgesia in labour (introduced in Chapter 1).

The first paradigm or belief system is dominated by the medical model of care. With the use of routine interventions and elective epidural provision obstetricians argue that childbirth today is safer than it has ever been. This is because of the increased medicalisation of the process and the use of modern technology. Women who choose and have belief in this model of care are usually passive (Blakka and Schauer, 2008), they feel safer by choosing the medical model and want the professionals to take responsibility, they do not want to feel pain and often have anxieties and fear about childbirth and need the security of the hospital environment and technology around them (Heinze and Sleigh, 2003).

In the second paradigm or belief system women want a natural model of care, they actively engage with and want to be in control of their childbirth. They want to promote a more natural pathway, maintain control over their own bodies and have the fulfilling experience that goes with it. These women often have less fear, engage with professionals, seek knowledge and prefer to make choices and decisions for themselves. Within this belief system labour and birth are seen much more as normal physiological processes, in which medical intervention is inappropriate unless clinically indicated (Green *et al*, 1998). These women feel that they can control the pain themselves with more natural therapies or non-pharmacological pain control without resorting to medically prescribed drugs.

Whilst these two paradigms are characterised as being at opposite ends of a spectrum, in reality they form part of a continuum with a vast area between their extremes in which women choose various options and combinations of care, for example choice of analgesia for labour and birth. Women can also move away from their espoused paradigm during their pregnancy and labour. Machin and Scamell's (1997) study showed this very clearly by exploring the irresistible nature of the biomedical metaphor during labour. Their study used forty primigravidae women who had planned to give birth in hospital (previous birthing experiences could not therefore influence the women's beliefs about childbirth). Even though many of these primigravidae women talked about rejecting medical intervention they still had a tendency to revert to the dominant medical childbirth culture at the time of their labour and birth. Women became vulnerable as they moved over a boundary into a domain where the medicalised procedures, once associated with safety become overwhelming.

The women in Machin and Scamell's (1997) study were from two groups. Twenty women attended NCT antenatal classes and the other twenty NHS women did not attend any classes. The NCT group wanted natural birth without the use of drugs and with the minimum of medical contact possible. Whereas the NHS group did not challenge the interventionist medical model, having little concern for any alternatives, wanting a painless delivery and a healthy baby and this group wanted to hand the responsibility over to the professionals. Some of the NCT group did become vulnerable as they entered the hospital in labour, as not only did the setting change but so did the rules. The NCT group had notions of maintaining personal control; however, their props for control were not strong enough to hold them in this altered crisis state. The NHS group had never aspired to notions of control, responsibility and personal autonomy and had anticipated this crucial setting change. The conclusions included that because birth is a ritualistic practice even the most determined anti-interventionist women may be easily swayed by the assuredness of obstetricians and midwives who may have powerful metaphors or the safety of science on their side (Machin and Scamell, 1997).

There is no data available on the distribution of women across each paradigm, and where the majority of women fit, however what is clear is that both paradigms are valid approaches to childbirth, and maternity services need to provide appropriate care to meet the needs of both belief systems of women.

Whilst I acknowledge the paradigm of the medical model of care preferred by some women who do not want to feel pain and choose pharmacological pain relief, the women in the present study held a belief system closer to the second more natural paradigm. This paradigm is one of a more natural model of care maintaining control and making decisions about their care and in particular their choice of pain control. It is also acknowledged that even though the women in the current study wanted a more natural childbirth without pharmacological analgesia, they chose to use various methods from the more natural therapies such as relaxation and breathing to TENS and on some occasions Entonox or a combination of these therapies/methods.

At the outset of the study the available literature on TENS was dominated by quantitative studies and predominantly by randomised controlled trials. There were no qualitative studies and therefore literature on women's experiences of using TENS was sparse. Johnson's (1997) large survey was one of the only studies to explore women's experiences and provided information on satisfaction, this important factor being overlooked in most

other studies. Johnson (1997) highlighted that the potential value of TENS for pain control in labour is often overlooked. In the current study TENS was found to support, enhance and maintain powerful feelings of control for the women which in turn affected their birth experiences. The body of evidence reviewed in Chapter 2 on the use of TENS in labour relating to 'control' was very limited and only six out of thirty studies mention control albeit briefly. Despite this the information in Table 2.3 demonstrated strong evidence of the satisfaction with using TENS for pain control in labour. Women showed a preference to use TENS again and recommended its use to other women.

Of the few studies that mention control Grim and Morey (1985) found good results with using TENS - in particular the ability to concentrate, use of breathing techniques and relaxation and being distracted, all of which helped to maintain control for the woman. Similarly, Miller Jones (1980) identified that TENS facilitated being mobile and as such having the ability to adopt various positions affected comfort for the patient and therefore her ability to cope. In both of these studies the majority of participants found some relief from the TENS and said they would use it again. The studies did not seek to investigate why the women liked TENS and would use TENS in subsequent labours. This may be partly due to TENS being designed in a laboratory and therefore being subjected to more trials than most other modalities to ensure its safety and its mode of action. The researchers had a focus on biomedical research and therefore these trials focused on the TENS machine rather than the women and their experiences. In the majority of studies reviewed in Chapter 2 the operation of the TENS machine was not undertaken by the women e.g. midwives operated the TENS unit under the patient's direction in Grim and Morey's (1985) study. Davies' (1989) study was one of the only studies to mention the importance for women of the ability to control their own pain relief and highlighted that women had begun to question the effect of pain relief on themselves and their babies. In the current study some women handed over control for only short periods of time to their partners but TENS was predominantly controlled by the woman herself.

In the current study control has been found to be complex and multi-dimensional. It is understandably different for each individual woman in labour. Green *et al* (1990) supported this and similarly found that control is not a uni-dimensional phenomenon and that the women's needs for control cannot be generalised and stereotyping may be less than helpful. Some women want to maintain control in labour and other women want to give up control to the professionals and want them to make decisions for them. This is discussed further in the section relating to external control (5.2.2).

‘Choice’ and ‘control’ are not necessarily synonymous even though the close relationship may suggest otherwise. Green *et al* (1990) found that they may be linked and indeed choice facilitates control and an absence of choice implies absence of control.

Although women talked about TENS as a form of pain control in the current study pain was rarely described in any detail. Women did however explain how TENS counteracted the pain, was a ‘stepping stone’ to getting rid of the pain and allowed them to do ‘normal things’. The usefulness of TENS for pain control was expressed by the women in terms of what proportion of labour TENS was used for. Women talked about getting ‘half way through’, ‘through a large chunk’ or ‘all the way through’ their labour with the TENS. Similarly, in McCrea *et al*’s (1999) study women also reported that they were in control of how their labour pain was managed rather than being in control of the actual pain.

Control has broadened from just meaning ‘self-control’ to a range of women-centred orientations with the crucial importance of being able to act to control her situation. Green *et al* (2003) found a sense of control to be a major factor contributing to a woman’s birth experience and her subsequent well-being. They refer to ‘internal control’ (control of your body and behaviour), ‘external control’ (control of what is done to you) and a third measure ‘control during contractions’. This has similarities to the current study findings and ‘control during contractions’ is related to internal control of self, external control of others and the control of the TENS machine. I will now move on to discuss the first component within the super-ordinate theme of control, namely internal control of self. Normalising labour and birth and trusting in TENS will be discussed within this section as they are part of the woman’s control of self.

5.2.1 Internal control of self

Personal control has been established as a central feature of women’s involvement in their childbirth experiences (Wright *et al*, 2000), and is an integral part of woman-centred care if the goal is to encourage women to be active in their care during childbirth (McCrea *et al*, 2000). Factors that have been highlighted in the current study affecting the internal control of the woman in labour are complex and multi-dimensional (detailed in Figure 5.1). Green *et al* (2003) suggested that there is evidence that women’s satisfaction with the experience of childbirth is affected by their sense of control during labour, and in particular, their sense of control during painful contractions. Goodman *et al* (2004) had similar results in

their study but add that women determined their satisfaction with their childbirth experience according to how well they perceived they had managed their own performance (their ability to maintain control).

In Broderick's (2008) study internal control meant facilitating a natural birth with the emphasis on avoiding interventions. Whilst all of the women believed that this was possible, they wanted to keep their options open and if intervention did become necessary it would be for the best. They therefore chose hospital as the place for birth due to the need for this security. Control was the central tenet in this study, it was recommended that healthcare professionals support women during labour in a way that minimised unnecessary interventions and allowed them to maintain control and integrity.

A woman's choice about pain control is more closely related to her ideas about childbirth than to her physical situation during childbirth. Heinze and Sleigh (2003) found that women who laboured without an epidural had a low fear of childbirth, an internal locus of control for childbirth and a desire to actively participate in the childbirth process. The maintenance of control or the 'ability to cope' can reduce the intensity of labour, therefore can also reduce the amount of pain relief needed (Melander and Lauri, 1999). Coping as defined by Nolen-Hoeksema *et al* (2009:525) 'is the process by which a person attempts to manage stressful demands', which fits appropriately with the demands of labour and birthing. Women in the current study used TENS as part of their coping strategy which contributed to reducing fear and anxiety in labour and control was maintained.

Lang *et al* (2006) looked at anxiety sensitivity as a predictor of labour pain. Their findings suggested that maternal anxiety and poor pain coping strategies (avoidance and escape) may lead to increased pain and potentially to the need for more risky procedures for delivery. For example, fear of delivery has been associated with emergency caesarean and ventouse delivery, arguably, a response to avoid or minimise pain of labour (Melander, 2002). Lang *et al* (2006) commented that often these women have heard 'horror stories' of labour and do not therefore attend antenatal classes because their anxiety increases when talking about the birth. Once labour begins and the pain of contractions starts the woman anticipates the pain of future contractions and begins to experience anxiety and fear. Providing education and helping women to talk about their fears or anxieties may help to minimize their pain expectations and also their pain experience, thus improving their overall birth experience. Women in the current study actively participated in their labours

by using TENS for pain control, they felt safe, secure and in control of their pain with TENS. Fear and anxiety were not expressed as feelings by these women.

Women's expectations affect their experiences of labour and birth. For multiparous women the main sources of information on which to base expectations will be previous experience. For primiparous women the main source of information is often childbirth education or preparation classes. It may therefore be expected that such classes play a unique role in shaping and formulating the expectations of women that have not given birth before (Green *et al*, 1998). Broderick (2008) found that whilst women wanted to maintain some control, women when thinking ahead to the birth revealed their apprehension of childbirth and the interplay of external factors of control on their expectations and experience of labour. Childbirth education classes need to focus on giving women adequate, accurate and realistic information on which to base their expectations of which TENS should be included.

Encouraging women to assert internal control over themselves and their behaviour may lead to tension and inflexibility in the woman who is unable to listen to what her body is telling her to do. Similarly, allowing or encouraging women to be involved in decision making may confuse them and increase their anxiety levels which may have negative effects such as the inability to relax. This may lead to panicky feelings and a sense of being out of control rather than in control. Furthermore, there is a danger of the woman being set up for conflict with the midwife and doctors who want to be in control. However, on the positive side being in control or perceiving that you are in control leads to a more positive birth experience, increased satisfaction and less depression (Green *et al*, 1998).

There was evidence from the current study of women using a combination of natural techniques such as relaxation and meditation in order to minimise stress, anxiety and fear and to remain calm. According to Mander (1998:113) 'Relaxation is the method of pain control allowing the woman the greatest input'. Psychological methods for pain control include relaxation and a woman's ability to relax has been a focus of antenatal education for many years. Relaxation techniques vary and some may involve meditative relaxation techniques for use in labour and birth. Meditation and relaxation have similarities but they have very different aims. During relaxation we deliberately stay away from whatever we are doing and thinking however when we meditate we deliberately stay aware of what is going on around us.

Non-pharmacologic approaches to the management of labour pain, were considered by Simkin and Klein (2007) including such therapies as TENS, massage, movement and posture, relaxation and breathing. They concluded that these approaches have few or no side effects and can be combined sequentially to enhance their total effect. Additionally, they help women to maintain or restore a sense of personal control over the birth process, this supports using a combination of natural non-pharmacological therapies for pain control, as were used by women in the current study. Women tried different combinations or approaches to maintaining control in labour, it was shown that what will suit one woman will not be the choice for another. Some women prepared and practised with TENS prior to labour, however, others choose not to. One woman in the current study used TENS and prayer throughout labour as a way of coping which helped to maintain her self control and was similar to Klassen's (2001) study.

Simkin and Klein, (2007) found relaxation and breathing to provide distraction from the labour pain and enhance a woman's sense of control. This is supported by Moore and Holden (1997) who advocated that practising meditation and deep relaxation can release stress and tension, mentally and physically, and encourage the secretion of hormones, namely endorphins.

'Feel good' endorphins are produced in our bodies when we are relaxed, calm, focused and happy. Sadler (1997) explained that in her opinion these endorphins are our bodies' own natural painkillers and also allow the healing processes to flow. TENS has been linked to the production of natural endorphins and enkephalins (Salar *et al*, 1981) both of which have an analgesic effect and can assist with pain control and the labour process. Massage, breathing and relaxation can encourage the endorphin release and can therefore be more powerful analgesics than pharmacological pain relief (Chapman and Charles, 2009) and combined with the production of endorphins from TENS in order to promote calmness, coping and control in labour.

There was a belief amongst women in the current study that TENS had the ability to build up endorphins to assist in their pain control and the normal physiology of labour. In Leap's (2000) study midwives talked about facilitating endorphin release in labour with relaxation, comfort, environment and feeling safe. Moore (1997) confirmed that endorphin levels in particular increase through labour and peak at delivery in order for women to cope with levels of severe pain. This could be further enhanced by the use of TENS, which is known to produce endorphins (Salar *et al*, 1981) and is perhaps why women feel

that the early application and the boost facility increasing the strength and stimulation of the TENS helps them to cope or maintain control.

In the current study aspects of each woman's personality became evident within the texts. The choice a woman makes relating to pain control in labour often relates to her type of personality. Personality has been defined as -

‘The distinctive and characteristic patterns of thought, emotion, and behaviour that make up an individual’s personal style of interacting with the physical and social environment’ (Nolen-Hoeksema *et al*, 2009:462).

There is very little evidence available which specifically relates to personality and pain relief (Moore, 1997), however Raph-Leff (1983) identified two specific ‘orientations’ to mothering. The ‘Regulator’ mother that regards labour as ‘depleting’, a ‘medical event’, ‘inflicted pain’; and the ideal birth as being ‘civilised’ with analgesia and monitoring. Whereas the ‘Facilitator’ mother regards labour as ‘exhilarating’, an ‘intimate event’; and the ideal birth as natural, resisting pharmacological and technical intervention. These two types of mother did not appear clearly in the current study sample, however the ‘facilitator’ type of mother appeared to be more prominent. These two orientations appear to reflect the two paradigms or belief systems previously discussed. Heinze and Sleigh (2003) stated that personality is one of the factors that contributes to the decisions a woman makes concerning her birth experience and her ideologies of what a birth should be like.

Lally *et al* (2008) found that the level and type of pain, pain relief, involvement in decision-making and control were the key themes in their study of expectations and experiences of pain relief in labour. Women may hope for a labour free of pain relief, but many found that they needed or benefited from it. Inaccurate or unrealistic expectations about pain may mean that women are not prepared appropriately for labour. Women expected to take control in labour in a number of ways, but their degree of reported control was less than hoped for. They recommended that antenatal educators need to ensure that women are prepared appropriately for what might actually happen to limit this expectation-experience gap and potentially support greater satisfaction with labour.

Having a positive attitude to labour pain may affect how the body copes in labour. Sadlers’ (1997) opinion was that in addition to developing self-esteem and general confidence, developing a positive, caring attitude can encourage pain-reducing endorphins to flow and healing to take place and the more confidence increases, the more we feel in

charge of our pain. This acceptance of the pain reinforces a positive attitude and enhances coping strategies. This reflects the current study findings in that women seemed to accept that they were going to experience pain and considered TENS as part of their strategy for coping with pain. Davis (2000) added that if a person feels that they can cope, participate and can do something about the situation it gives them a kind of self confidence and motivation.

Women powerfully expressed the use of 'I' and 'my' in the current study and emphasised wanting to be independent and take responsibility for themselves and for their pain in this study as part of their internal control. Walsh and Downe (2010:198) included a research study by Gill Thompson in their recent book. The study uses a similar approach to the current research study and found similarities with the use of 'I' and 'Me'. The study section 'It was all about me' - where the woman was 'centre stage, took the lead and the midwives were seen as the supporting cast', closely relates to the findings of the current study.

'The narratives revealed that a positive birth was a unique, individually determined, woman-led affair. It represented an embodied experience: an integration of mind, body and spirit, as women were active, engaged, informed and 'in control' over the birth' (Thompson, 2010:198).

Various psychological factors have been shown to influence a woman's perception of pain and her ability to cope with it. Positive or negative feelings about the labour experience would appear, in many instances, to relate to whether the woman feels in control of events. Such events often relate to labour outcome, that is whether the birth process is perceived as a satisfying experience, and whether the woman feels that she has had control over decision-making at all times (Moore, 1997). For the participants in the current study the majority saw the labour as a satisfying experience after the labour event, however this does not mean that it felt 'easy' for any of them. Many expressed that they enjoyed their labours and the birth experience. They mention 'psychological factors' however they do not perceive that whether TENS has a psychological effect or not matters as long as the TENS helped and worked for them. It was expressed in the current study that 'psychologically' if the intensity of the TENS needed to be increased, this meant that the pain was getting stronger and more intense and therefore that labour was progressing. Therefore, controlling the actual TENS machine was linked to enhanced feelings of self control for some of the women in this study (see section 5.2.3).

‘Giving birth is a parasympathetic process, a physiological condition that requires a feeling of ease, rest, comfort, confidence, and security. When these environmental conditions are not met, anxiety and fear inevitably trigger a stress response that inhibits uterine contractions and increases the likelihood of prolonged, dysfunctional labour’ (Reuwer *et al*, 2009:131).

The main task of the midwife is to create an environment in which hormones that support the labour process can flow freely and abundantly in order to preserve physiological processes as much as possible. Where this is not possible, it is important to use techniques that maintain the woman’s confidence and faith in her body, and that allow her to work as much as possible with the labour (Schmid and Downe, 2010).

The emotional aspect of pain is a feature of many psychological issues relating to the pain experience. Pain is a subjective experience and human beings are unique individuals, each person perceiving, experiencing and responding to pain in their own unique way (Moore, 1997:48). The women in the current study used TENS for pain control in whatever way was helpful to each of them, there was flexibility in the use of TENS to enable each woman to have her own unique experience.

Midwives aim to treat each woman individually. However they often have to care for and support more than one woman in labour at a time. There is also the pressure as Walsh (2006:281) noted when he developed the concept of ‘Fordism’, moving an assembly line with mass production, within a typical National Health Service (NHS) maternity unit, where women are processed using a mechanistic model, which has a time scale for completion of the process within a highly sophisticated regulatory framework. The midwife has a hard task but in order to support the normal philosophy of childbirth, she must focus and use her knowledge of normal physiology and her clinical experience alongside her knowledge of the woman she is with. Supporting the use of TENS may contribute to making the midwife’s task easier particularly if the woman can maintain control in labour.

‘Normalising labour and birth’ or ‘promoting the normal birth pathway’ is inter-related with all of the themes in the current study and as a consequence it is strongly related to the woman being able to be in control of herself. Two distinct areas were closely linked to promoting normal birth. Firstly, TENS promotes the normal physiology of birth by enabling the women to be mobile and using upright postures. Secondly, having a ‘natural

and drug free' labour and birth using TENS instead of pharmacological analgesia. Being able to move freely was part of the coping strategy to maintain control used by the women and being 'drug free' enabled women to remain alert and aware of what was happening, therefore enhancing self control.

Being mobile in labour and allowing the woman to change position whenever she needed to was important and promoted normal birth in the current study. Various positions such as kneeling, all fours, standing, sitting on a ball and many others were used. One important factor for the women in this study was not being restricted with movement and being able to perform normal tasks like going to the toilet. The TENS machine provided pain control and did not prevent women from mobilising in labour, many women went for walks whilst having contractions and TENS being small, portable and easy to use facilitated this. TENS enabled normality to be maintained.

Some women in the current study had experienced previous labours and births and used their past experiences to inform their choices for this labour, the majority were informed enough to know that upright postures and mobility are important and assist in the progress of normal labour. Others just did what they needed to or what their bodies 'told them to do', however one woman did rest in the supine position early in labour with the TENS on.

It is possible that midwives' competence at assisting birth in non-recumbent positions affects the advice and support that they give women in their care. Balaskas (1995) captured the psychological dimensions of birth posture to illustrate the powerlessness and helplessness of being on your back, in fact a 'passive compliant patient'. During established labour all of the women in the current study that talked about mobility being paramount (16/20) remained mobile and changed positions as they needed to with the TENS machine on.

A number of advantages have been concluded for upright postures by De Jonge *et al* (2004) and Gupta and Hofmeyr (2006) in meta-analyses of positions for giving birth such as a shorter second stage, fewer episiotomies, fewer assisted births, less severe pain, bearing down is easier and fewer fetal heart abnormalities. The women in the current study naturally adopted different positions and upright postures resulting in normal births and the feeling related to the maintenance of control.

Michel *et al* (2002) stated that in upright postures the flexion and abduction of the hips, combined with the freedom for the coccyx to articulate backwards, provide greater room at the pelvic outlet, both in the anterior/posterior and transverse dimensions. Being free to move and change position is of paramount importance for normal labour and birth physiology. Women intuitively know and often express this in childbirth, if not they should be encouraged to adopt upright postures for second stage and for birth. There was evidence from Foster (2005) that a taught programme in active birth showed a remarkable increase in upright posture for birth and a 50% reduction in epidurals compared with a group that did not access the programme. This supports the link of being mobile and using upright postures with wanting to be natural and drug free and preventing intervention which came together in the current study to form the theme of normalising birth with the use of TENS.

The bed was referred to by over half of the women in the current study, particularly 'not wanting to get on the bed' in fact they saw it as an intervention and some could not understand how it would have been possible to be on a bed. They did not want to be restricted and knew that forms of pain relief such as pethidine and an epidural would restrict their mobility due to their narcotic effects. This is, perhaps intertwined in the whole philosophy of normal birth for these women and reinforced their preference for not wanting to use pharmacological analgesia in labour. Women were also able to adopt whatever position they wanted to in order to birth their babies, whereas if the bed is used this is made much more difficult.

Walsh (2007:86) also stated that 'the bed is the most potent symbol of medicalised birth and any intervention that physically inhibits regular positional change, restricts women to being on beds or psychologically discourages them from moving is to undermine normal birth physiology'. If a bed is pushed to one side or removed, the woman has more access to room space and can move much more freely, she will also not see the bed as the 'focal point' of the room and feel that she must be on it. The RCM (2005) advocated as one of their eight tips for normal birth called 'get her off the bed' and quote that -

'Gravity is our greatest aid in giving birth, but for historical and cultural reasons (now obsolete) in this society we make women give birth on their backs. We need to help women understand and practise alternative positions antenatally, feel free to be mobile and try different positions during labour and birth'

(RCM, 2005:8).

In the current study the environment affected the freedom to move around, the home being a familiar place for having personal space and one in which to choose a place or position to be in for labour and delivery is made easier. The hospital labour room, with its bed as the central focus is less easy to adapt or achieve privacy and personal space within. Whilst the women in the current study described having an inherent restlessness and not being able to stay still, they rocked back and forth, paced and danced which is often associated with the release of endorphins and TENS, being mobile, allows this freedom of movement. This need for freedom to move is supported by Walsh (2007:82) who wrote about 'the dance of labour' in reference to the chemistry of birth hormones and in respect of women's movements in labour and says that an inherent restlessness amongst labouring women is particularly noticeable in women having non-medical labours and births.

Similarly, Simkin and Ancheta (2005) wrote about labour progress and they see postures and positions as fundamental to labour rhythms and to the act of birthing. The women in the current study had the knowledge that being mobile and in an upright position made sense and gravity would encourage the baby to move down. Women knew intuitively that they needed to be mobile and not restricted in any way, which is perhaps what fuelled their search for a form of pain control such as TENS that would allow them to adopt positions, be completely mobile and thus in control of themselves.

Being mobile and able to adopt postures for labour and delivery were positively mentioned in three studies within the preliminary literature review on TENS. Mobility and adopting various positions affected comfort and the ability to cope, TENS allowed freedom of movement and women were able to relax, remain alert and in control whilst in labour (Miller Jones, 1980; Stewart, 1986; Van der Spank *et al*, 2000). This supports the findings in the current study and identifies the link between being mobile, remaining alert and free from the effects of pharmacological analgesia and being able to remain in control in labour (the theme of normalising labour and birth – see Figure 5.1).

Many other studies of TENS (Chapter 2) used interventions that limited women's mobility whilst using TENS in several ways – the women in these studies were high risk, many were induced, intervention was used and they were predominantly cared for on the bed (Augustinsson *et al*, 1977; Chia *et al* 1990; Davies 1989; Edwin *et al* 1990; Erkkola *et al* 1980). Van der Ploeg *et al*'s (1996) study could not consider mobility and freedom because it used a patient-controlled analgesia (PCA) system, women were strapped to a cardiotocograph monitor and narcotic drugs were used affecting the woman's conscious

state and possibly her assessment of TENS. The limited mobility of the participants in these studies restricted women and did not use TENS to its full advantage of being mobile pain control and promoting the normal birth pathway for women.

De Jonge and Lagro-Janssen (2004) advocated that midwives have an important role to play in widening the range of women's choices and they should empower them to find positions that are most suitable for them by giving practical advice during pregnancy and labour, particularly advice relating to pain control that will facilitate adopting these positions with TENS. Trials of mobility during labour have concluded that it reduces the need for analgesics and improves satisfaction with care (Bloom *et al*, 1998; MacLennan *et al*, 1994; Hemminki and Saarikoski, 1983). Similarly, many studies found that TENS reduced the amount of analgesia such as pethidine (Bortoluzzi 1989; Bundsen *et al*, 1981; Grim and Morey, 1985; Miller Jones, 1980). Many women that remain mobile are able to achieve a much more normal labour without using pharmacological analgesia, which due to its sedative effect restricts mobilisation and affects internal control of self.

'Wanting a natural and drug free labour and birth' was highlighted by the majority of women (19/20) in the current study, who had considered their pain relieving options but had decided strongly that they preferred to use TENS as non-invasive and non-pharmacological pain control particularly due to the effects of pharmacological analgesia such as affecting consciousness and mobility for them and the side effects for the baby. Collectively, the women in the current study presented as being well informed about all forms of analgesia, including their side-effects and limitations. Van der Spank *et al* (2000) identified that in recent years there is a desire to avoid conventional invasive types of analgesia and women are beginning to question the effects of pharmacological analgesia on themselves and their babies, therefore non-pharmacological, such as TENS and natural methods of pain control were becoming more popular.

It was important to the women in this current study that they did not want pain control that would have side effects on the baby. Pethidine as with other opioids, can induce neonatal respiratory depression and decreased APGAR and neurobehavioral scores in the neonate (Levy, 2007). Many studies identified that there were no side effects to the baby with TENS (Bundsen *et al*, 1981; Chao, *et al*, 2007; Davies, 1989; Dowswell *et al*, 2009; Kaplan *et al*, 1998; Lee *et al*, 1990; Padma *et al*, 2000; Wang *et al*, 2007), many of these studies that did not conclude TENS to be as effective as other forms of analgesia however still acknowledge this advantage over other analgesia.

The non-invasive nature of TENS is certainly an important factor for many women (Moore, 1997) particularly for women in the current study who aimed to prevent intervention with the use TENS. A study by Wang *et al* (2007) was the first study to find that TENS can strengthen uterine contractions and therefore accelerate the labour process (this dual effect is not seen in any analgesic drugs). This is a very relevant finding and TENS could therefore be considered as a more natural way of accelerating or inducing labour instead of using invasive drugs, more research is needed here.

Women in the current study maintained self control with using TENS in their home environment before going into hospital and TENS was used for women planning home births. Some women often arrived at the hospital in advanced labour having only used TENS and a combination of mobilisation and relaxation. Padma *et al* (2000) found that due to its quick onset TENS can be used for women having rapid labours as a sole form of analgesia and Dowswell *et al* (2009) suggested that TENS could help to manage pain at home in early labour, both therefore agreeing with the findings of women in the current study.

Simpkin and Klein (2007) supported the natural methods used by women in the current study in combination with TENS and recommend non-pharmacologic techniques for management of labour pain can be combined or used sequentially to increase their total effect. They concluded by adding that women tend to rate non-pharmacologic pain control highly in terms of satisfaction and a desire to repeat their use in a future labour as shown in the TENS studies in Table 2.3.

Of course some women will prefer to have a managed labour with opioid drugs or epidural analgesia, however for many women this is to be avoided wherever possible. Women voiced a preference to avoid pethidine and epidurals in the current study to remain in control of themselves in labour by using TENS for pain control. Walsh (2007) reminded us that -

‘opioids and epidural agents are powerful drugs that are incompatible with physiological birth’ and ‘women need to know about the effectiveness, side effects and increased labour interventions with pharmacological agents, particularly epidurals’ (Walsh, 2007:65).

Walsh (2007) also advocated that pharmacological agents strive to mask, subdue, disassociate and anaesthetise by separating pain from the experience whereas natural therapies recognise the interconnections of pain with physiology and psychology and strive to work with it. The women in the present study seemed to be striving to achieve interconnections and were using TENS to help them do this.

One of the reasons for women choosing to use TENS in the current study was their desire for a normal low risk birth. Women were aware of the effects of these sort of interventions that Walsh (2007) had referred to, particularly if they have been disillusioned in previous labours. This may explain why their ideas or beliefs supported trying non-invasive non-pharmacological pain control such as TENS. Women in the current study were often influenced by previous labour experiences in their decision to use TENS. They wanted to avoid pharmacological pain control, prevent intervention wherever possible and they wanted a ‘normal birth’ if they could achieve it.

‘The underpinning philosophy for midwife-led care is normality and being cared for by a known and trusted midwife during labour. There is an emphasis on the natural ability of the woman to experience birth with minimum intervention’

(Engel, 2009:30).

Despite advances in midwifery care, the basic physiology of birth remains unchanged. The same cannot however be said for technology and interventions, which seem to have become part of the majority of women’s routine labour and birth. This could in turn undermine women’s self control which may be unnecessary for routine labour and birth.

In the current study believing in TENS and having confidence in TENS come together to form ‘trusting in TENS’ (see figure 5.1), this in turn affected the women’s ability to remain in control of themselves during labour and birth. Women expressed that this trust developed over the antenatal period when they considered what methods of pain relief they wanted to use and chose to seek information and support relating to TENS. Positive support from the midwife in providing information on the use of TENS in the antenatal classes and in labour influenced their degree of belief and confidence and therefore affected their trust in TENS. Women appeared to trust TENS and themselves more when the midwife was helpful, supportive and knowledgeable. Women who had a close relationship with the midwife voiced trust as being a part of the relationship (Edwards,

2000). Therefore if a woman trusts her body and TENS, being cared for and supported by a midwife who shares this trust in her and TENS is more positive.

According to Moore (1997) women can manage pain in labour with no adverse consequences using relaxation techniques together with non-pharmacological methods such as TENS, if that is what the woman believes in and trusts. The current study highlighted that midwives who challenged the women's use of TENS increased the vulnerability of the woman, which in turn reduces her control of herself in labour and birth.

Trust, belief and confidence were not mentioned at all in the TENS studies in the literature review. The current study however found that in order for the women to be in control they needed to feel supported and have the knowledge in order to use TENS effectively in labour. Positive support and information from the midwife influenced the degree of trust in TENS and affected women's belief and confidence.

Trust is often linked to the midwife maintaining a supportive environment to allow the woman to interpret her body's signals. If the midwife fails to do this, the woman's trust in the midwife, the partner and the environment is likely to be diminished (Lundgren and Dahlberg, 1998). Niven's (1994) study found that 'trusting the staff' was associated with significantly lower levels of pain in labour and women that had a good relationship with the staff were able to use a greater number of coping strategies such as relaxation.

'Trusting the staff' was also linked to women feeling supported and in control or the midwife taking control if the woman had requested this (Grim and Morey, 1985). This relationship between woman and midwife not only affects internal control, but extends to external control in the current study (section 5.2.2). A further study focusing on trust between midwives and women and the maintenance of control in labour that links with pain 'control' is needed.

Women commented on their experience and how TENS without any side effects promoted normality and maintained control. Women came home from hospital soon after birth, were pleased with themselves and they were happy to feel well and be home with their families. The majority of the women in the current study had confidence in themselves, which assisted in maintaining a healthy physiological experience. This is supported by Kannan *et al* (2001) who found that women who were confident in their ability to handle labour pain had a greater likelihood of successfully completing natural childbirth.

In the current study internal control of self has been enhanced by the use of TENS which supports the multi-dimensional factors of control and has been shown to assist in the normal physiological process of labour and birth of which mobility and natural and drug free pain control were important factors. The participants had confidence and a belief in TENS and therefore trusted in TENS as a method of pain control which affected their expectations and satisfaction of their experience of labour and birth. The women's external control of others and the environment is closely related to, but goes beyond, the internal control of self and will now be discussed in the following section.

5.2.2 External control of others and the environment

The current study found that the majority of women wanted to feel in control of themselves (internal control of self), and to be in control of others around them throughout labour and birth as well as the environment (external control of others). In order for the women to feel that they had external control they needed to interact with the midwife and their partner. Support from the midwife antenatally and in labour and support from the partner facilitated external control for women. The absence of this support was shown to decrease external control for some women. The meaning of 'external' control here is similar to the concept discussed by Green *et al* (1998:19) of women's 'control over their environment and all that is done to them'. The current study also has similarities to Broderick's (2008) study where external control factors related to the role of the support person and the role of the midwife. Mander (2010) suggested that the word or meaning of 'environment' is not just the room, area or building in which the woman labours but is also broadened to include, as well, other people and their behaviour towards the woman in labour. These people include the partner, family members, the midwife and the professionals that are involved. The environment in its widest sense in which the woman gives birth is increasingly being recognised as crucial to her satisfaction with her experience of birth (Mander, 2010). The findings of the current study highlighted that women wanted to maintain feelings of overall control of others and the environment where possible (external control).

Other researchers (e.g. Heinze and Sleigh, 2003) have described external control as being associated with women wanting to hand over the control to the professional thereby having a 'high external locus of control', this is not the meaning adopted in the present study.

Midwives work between the belief systems of the medical paradigm where women may want to hand over control to the professionals and the natural childbirth paradigm where women want to maintain their own control over themselves and others. Although midwives have to move confidently between these belief systems they may be challenged when caring for women who hold different views to themselves relating to pain and pain relief methods in labour and control over the labour and birthing process.

In their study Heinze and Sleigh (2003) highlighted the two different belief systems or paradigms by looking at the differences between women who laboured with or without epidural anaesthesia in relation to beliefs about childbirth and pain control choices. Fear of childbirth, control for childbirth, desired participation in the childbirth process, and knowledge of epidural risk were assessed. Women who chose to deliver with an epidural had a high fear of childbirth and trusted professionals to take control, and they had a desire for passive compliance in the childbirth process. Conversely, women who laboured without an epidural had a low fear of childbirth, wanted to be in control themselves, maintain personal control and had a desire to actively take part in the childbirth process. These women also scored higher on a scale designed to assess knowledge of risks associated with epidural use (Heinze and Sleigh, 2003). Positively, women in the current study chose to use TENS, did not express fear of childbirth and were able to actively take part in their labour. They were able to remain alert and mobile without pharmacological analgesia and TENS enabled this.

Women may experience little control over events, since control is frequently maintained by the professionals who 'manage' labour. The degree of autonomy which a woman has throughout birth will often be influenced by those in attendance during the event, and also by the woman's own belief systems (5.2.1) and ability to control events (Moore, 1997). On the other hand being involved actively in their care may help to promote feelings of 'being in control' and enhance women's confidence in their own ability to control pain experienced (McCrea *et al*, 1999). Women in the current study were generally very actively involved in their care, particularly those birthing at home. Confidence was maintained as was the ability to be in control of their pain when supported by using TENS.

The unpredictable nature of labour pain and the fact that the experience can be different, not only between women but also between and within labours, highlights the importance of the call to promote and continue one-to-one care in labour. Doing this may help women to maintain the external control they need in interactions with the midwife. Wright *et al*

(2000:1175) suggested ‘Individualised care could contribute to positive childbirth outcomes, an important consideration for personal control in pain relief’. It is therefore important when selecting pain ‘controlling’ strategies to ensure a good fit between the woman’s wishes and the strategies used and supported by others. This is necessary in order to allow the woman to maintain feelings of control over those involved in her care and any equipment that is being used.

The relationship the woman has with the midwife providing care for her can affect the amount of support she receives. This can affect, not only her internal control but also can impact her maintenance of external control. Pairman (2006) advocated that the relationship between midwives and women provides the medium for midwifery care. These relationships are equal and negotiated partnerships and have an increased possibility for the empowerment and strengthening of women so that they can control their own childbirth experiences.

In the current study women who wanted to remain in control of the external factors such as what was done to them in labour by staff and the environment needed to interact with the midwife. This was important in order for the midwife to offer support and to facilitate this external control. The relationship between the woman and the midwife and the communication between them was paramount in order for the midwife to be aware of the extent of control that the woman wished to maintain and for her beliefs and ideas to be shared with and facilitated by the midwife, particularly her desire to use TENS for pain control.

Some women in the current study had to work hard to maintain their use of TENS as their chosen method of pain control in the hospital environment. The midwives views and beliefs were different from the women’s and on some occasions the women had to challenge the midwife in order to remain using TENS and to remain in control of the birthing environment. Kaufman (1993) suggested that the midwife can increase a woman’s knowledge and sense of control through a relationship built on trust and confidence. The midwife has in her professional position of power an authority in relation to the birthing woman. She can through her attitude, actions and way of listening and giving information, reduce or increase the birthing woman’s freedom and support and feelings of control (Blaaka and Schauer, 2008). Leap (2000a) suggested that midwives might use this power to liberate the woman however it can also be used to put the woman into a position of subjugation. Using power appropriately is a skill that lies with the

midwife and is linked to knowing when to inform, act, seek help and most importantly, be still or withdraw. Leap (2000a) added that this way of empowering women can have far reaching consequences for their feelings of self worth and self-confidence, all assisting their feelings of maintaining control of the external features of their labour.

When the midwives gave advice, helped to apply the TENS and were supportive of the use of TENS in the current study, the women expressed trust in the midwife. This enhanced self-confidence in the woman and in turn helped with feelings of being able to cope (internal control), which then extended to feelings of being in control of others and the maintenance of control of the environment. In essence, the midwives were enabling the woman's external control by offering her support with the use of TENS.

Schmid and Downe (2010) suggested that by midwives maintaining confidence and belief in the woman, her trust and coping strategies are enhanced. It is therefore a two way exchange between woman and midwife. Niven (1994) also suggested that some midwives' lacked confidence in a woman's ability to cope with labour affecting their attitudes towards certain coping strategies. Some midwives have a fundamental belief that pharmacological methods are the only effective form of analgesia, and are therefore likely to promote them more readily. Pain relief is therefore sometimes encouraged not to reduce the woman's pain, but merely to comfort those who are observing (Moore, 1997). This can mean that the woman is encouraged to have sedation, usually by administration of narcotic agents such as pethidine (Moore, 1997). Similarly, in the current study when the midwives lacked knowledge and training with the TENS they suggested removing it and offered pharmacological pain relief. The midwife perhaps felt uncomfortable with the woman using TENS however in this case the midwife's beliefs have affected the woman's control. The woman no longer felt in control of herself due to the lack of confidence from the midwife, her trust in TENS was challenged by the professional and she then relinquished her external control of her decision making, her environment and what was being done to her by professionals.

The midwife and obstetrician or both sometimes assume that they should have control. Women are often aware that this may happen and remain at home for as long as possible in labour if they are calm and relaxed, comfortable and are able to take control. Ruewer *et al* (2009) stated that the key issue is not the location of birth, be it the hospital, a birth centre, or the home, but rather what supports the best chance of a safe and rewarding delivery. This can be achieved by midwives supporting women within the environment and creating

the feeling that the woman is in control of her labour by the midwife offering whatever pain control the woman chooses, wherever she births. In this way midwives are not only facilitating the internal control of the woman but the support provided goes further and allows the woman to remain in control of the external factors which can affect control.

It is acknowledged that some women, particularly if high risk will feel more in control in the hospital environment such as in Snowden *et al*'s (2011) study of the analysis of choice and control in childbirth. Women were given the choice of going home to be more relaxed but felt a sense of control through staying in hospital as they felt that this was the safest place to give birth. Thereby exerting control over their environment. Control means different things to different women but all the evidence points to positive outcomes where control is perceived to have been maintained, irrespective of the birth environment. Control, when removed unwillingly is viewed as a more negative experience (Walker *et al*, 2005).

Carolan and Hodnett (2007:140) described 'women centred' and 'in partnership with women' as terms associated with midwifery care and the underlying philosophy has emerged both as an antidote to the medicalisation of pregnancy and in a bid to reacquaint women with their natural capacity to give birth successfully and without intervention. Carolan and Hodnett (2007) suggested that there are competing forces between midwives as guardians of vulnerable childbearing women versus physicians wishing to take over and medicalise pregnancy. In general the championing of normal birth by midwives is a positive move that has led to a reduction of clinical interventions in labour and a reduction in the intrapartum use of analgesia (Hodnett, 2000). This midwife-woman relationship aims to build confidence and to empower the woman to trust her own body and to take some control over her baby's birth (Leap, 2000). This interaction and communication between woman and midwife is vital in order to support the woman and for the midwife to be able to support the woman in decision making and maintaining her external control of the environment and all that is done to her.

For most of the women in the current study one-to-one care was received in labour and many midwives supported the use of TENS, acknowledging that it was helping the woman to cope with her labour pain. The TENS often allowed the women time to think, space and confidence in her 'control of everything'. However, some women found it difficult to remain in control when they did not feel supported with the use of TENS. The change of environment from home to hospital seemed to affect feelings of control and lack of

support, although a change in the midwife providing care may have influenced this.

Women sometimes had to assert themselves at times in order to continue to use TENS as the pain control method of choice.

Practices can sometimes be challenged if the woman feels ‘assertive and confident enough to negotiate this’ (Kirkham, 2000:72) however, many women feel unable to challenge midwives. Even though women often believed that they should be listened to and be central to decision-making, Kirkham (2000) described women who were often hesitant about their capacity to know in the face of the ‘expert’ and felt disempowered particularly when their grand ideas of being in control were dashed and seen as just fantasies.

‘Pain relief’ often involves offering the woman a menu of pain control methods, sometimes in antenatal education classes or in early labour. This menu may be seen to decrease the woman’s confidence and even though not intending to, indicates to her that she will inevitably need a selection of techniques and medications (Evans, 2006). Conversely, if midwives are aware of all of the options for pain control including TENS and discuss them antenatally in order to support the woman in her choices, the midwife is more likely to offer alternatives to the woman’s selected choice only if the woman then requests them.

Naumburg *et al*, (2010) stated that -

‘For the provider (midwife) who promotes natural, or “physiological”, childbirth with minimal technology, woman-centred care involves focusing on giving the woman “control” of her experience as she defines it’

(Naumberg *et al*, 2010:304).

This control is underpinned by giving the woman support in whatever pain control she chooses to use. Ford *et al*, (2009) found that feeling supported by hospital staff led to women feeling more in control. Leap (1996) described in her study that midwives’ recognised that a certain degree of pain is a fundamental aspect of healthy labour and this reality meant that the midwives were able to accept that the woman’s pain, and her expression of it, was not pathological and did not automatically require the midwives to either remedy it or remove it. Leap (1996) explained that the midwives’

‘Philosophy was founded on their confidence in the ability of the woman and the woman’s body to give birth spontaneously and physiologically’.

The woman's confidence in her body, her self and her close companions is often diminished and the midwives perceived their crucial role as to create, to enhance or to re-establish that confidence' (Leap, 1996:50).

Many women in the current study felt confident and supported with the use of TENS, they had established a relationship with the midwife and felt in control of labour and what was happening in the environment around them. Weaver (1998) suggested that the carer's personal and occupational experience may also feature in the control equation, similarly Green *et al* (1990) described in broader terms, personal relationships with staff being fundamental to the woman's sense of control. Thus, the concept of control may prove to be both interactive and dynamic (Weaver, 1998) as well as complex and multi-layered.

This current study describes control in depth and the importance of this in the context of using TENS for pain control in normal labour and birth. The findings highlighted that the environment can affect the inner calmness of the woman and that a third of participants in the study chose home as their birthing environment. Women had considered their pain control options and had chosen TENS which was easy to use at home. One woman in the current study prepared her labour area/pool room to create a safe and peaceful environment by painting one wall to focus on whilst she was birthing her baby. She was emotionally prepared, used TENS and had the support of the midwife and her partner along with being at home and in control of her birthing environment. Being in their own personal space or environment had a calming influence and atmosphere for many women and the freedom to move around and change position was easier for women at home (Section 5.2.1). This allowed them to feel more in control of their surroundings and the people present.

The six women who had chosen to deliver in the home environment in the current study were able to maintain control facilitated by TENS and the midwives support. The occasions when women expressed that control had been reduced were in hospital, this may have been due to other factors, for instance change of environment. This perhaps suggests that it is easier for the woman to remain in control in her own environment where she feels more comfortable, calm, relaxed and confident. The birth environment of labour is therefore significant in enabling a woman to find a safe place to give birth, use pain control that she chooses and the privacy, security and not being disturbed remains essential for her control.

In order to remain in control of others around them women in the current study received support from the midwife, the partner, family members and one woman was supported by a doula. It has been suggested that the most significant behaviour or activity of partners, family members and professionals is their ability to offer effective support to the woman in labour. Support brings different meanings to the same person at different times and certainly different meanings to different women (Mander, 2010).

The midwife's support antenatally and in labour affected the women's use of TENS and the partner's support was also a prominent feature of this research study. Support in labour was not discussed within the available TENS literature, apart from McMunn *et al* (2009) who suggested that midwives thought TENS enabled women to be mobile and facilitated a positive physiological impact on the progress of labour and could reduce the need for intervention.

Women in the current study felt that by being supported by the midwife, contributed to the maintenance of external control. Part of this support was to provide information relating to pain control options for labour and birth. For the majority of women in the current study antenatal classes provided information (see also section 5.2.3) on TENS as a choice of pain control, although this was inconsistent and varied widely among participants. Some women were able to see and practice with the TENS machine. The midwife provided more in-depth information which helped women make the decision whether TENS was a form of pain control that they would want to use. Often women had ideas of using TENS and this knowledge helped them to confirm their decision of whether to use TENS or not. Some of the women that attended antenatal classes however did not have the opportunity to discuss TENS or did not know about it. The women that acquired TENS at the last minute felt that they did not use TENS as well as they could have done or to its maximum effect and expressed that they would like to have had more information and the opportunity to familiarise themselves with the TENS and try the sensation prior to labour (Section 5.2.3).

De Ferrer (2006) stated that even though TENS is usually accompanied by instructions many women would have liked to have been shown what to do with the TENS at antenatal classes. It is recommended that midwives should advise the women intending to use TENS in labour to become thoroughly accustomed to both the application of the electrode pads and the operation of the TENS machine itself (Price, 2000). Midwives should inform women of the need to ensure that electrodes are correctly applied as incorrect application may reduce the effectiveness of the TENS machine (Coates, 2000).

Antenatal educators need to ensure that pregnant women are appropriately prepared for what might actually happen to limit the expectation-experience gap and potentially support greater satisfaction with labour (Lally *et al*, 2008). This is true of all aspects of antenatal education including pain control. An example of beliefs affecting expectations from the medical paradigm is the study by Scapiro *et al* (1998) who discovered that women who chose epidurals did not expect to feel any pain. They often suffered breakthrough pain which was not their expectation and which negatively affected their experience. A realistic expectation therefore was advised to encourage antenatal patients that modern methods can relieve, although not totally abolish, pain in labour. Antenatal preparation for all methods of pain relief choices are desired in order for women to be properly informed and to make their expectations realistic. This will in turn increase their awareness, satisfaction and improve their birthing experience whatever their choices for managing their pain.

Women received varying responses from midwives about the use of TENS in labour. Some midwives in the current study area hired or lent the TENS machine to the women which in turn gave the women the confidence that the midwives were in support of and approved of TENS. Midwives often used this opportunity when hiring the TENS to offer a one-to-one session on the use and application of TENS. This suggested that the midwives that were knowledgeable and confident about TENS had a positive effect on women and the experience of using TENS in practice. Women identified that they would like to hear about other women's previous experiences of using TENS for pain control in labour and felt that hearing women's accounts and practicalities would contribute greatly to their own knowledge base and in turn their feelings of control in labour.

In a recent national survey by McMunn *et al* (2009) it was acknowledged that the evidence base from which to inform women is currently poor but that midwives believed that TENS should be an available pain relieving option for women. Midwives were keen to support the use of TENS in labour, however, McMunn *et al* (2009) identified that there was a lack of training on TENS application for midwives and only 7.9% of midwives had received any training. It would therefore be difficult for the midwives to correctly advise women if they do not have a sound knowledge base themselves. In light of McMunn *et al* (2009) recent survey covering a national cross section of midwives being consistent with the findings of the current study, a training need for midwives on TENS application and use has been highlighted. Some midwives are very knowledgeable, and will train their students, our midwives of the future. However this is not the case within every locality.

In the current study women looked to the midwives for their approval of using TENS and often asked the midwives to check the positioning of the pads if they or the partner had applied it. The midwives level of experience in using TENS affected the support given to women. It has been shown in the current study that it is necessary for midwives perhaps to see TENS as part of the ‘broader picture’ and that supporting women with the use of TENS for pain control in labour can improve their experiences of, not only using TENS but being in control in labour. Midwives knowledge affects the woman’s experience of TENS and this knowledge base is important to be able to offer effective support to women.

Stewart (2010) said that the role of the midwife is not to tell women what to do and what to believe in, but to support them in order that they can make decisions for themselves even if the midwife does not agree with the decision. Support in labour and therefore support of women using pain control methods including TENS is important and has a short and long-term impact on how women view their experience. This supported Simkin’s (1992) view that how a woman is treated by the professionals on whom she depends may largely determine how she feels for the rest of her life. This therefore highlights the importance of midwives supporting women antenatally and in labour in what ever way is needed and the impact that this can have on her. McCourt *et al* (2006) suggested that being with the woman and helping her to discover her own strengths while offering her companionship is important to her labour and birth experience.

Along with the support of midwives, the partner often plays a very supportive role of which can also enhance the woman’s feelings of control in labour and birth. Broderick (2008) stated that the partner was a source of comfort and support for the woman in labour. Within the current study the partner’s support was highly valued by the participants (17/20), particularly assisting with the practical application of the TENS machine, of which some partners were reported to have acquired the information from antenatal classes and some from experience of previous labours. The majority of women in the current study discussed the partner’s interest and supportiveness with TENS. Some partners controlled the TENS machine for the woman if they were instructed to do so, giving them as reported by the women a ‘sense of purpose’, ‘something to do’ and a ‘feeling of being involved’. The women felt in control of their partners in labour when they instructed them how and where to apply the TENS and also when they allowed them to control the TENS machine under the women’s instruction. This was useful for the woman particularly as it did not remove her control, it often strengthened her external control in labour and birth.

Davies (1997) found it useful that partners could occasionally boost the stimulation at the command of the woman. The majority of partners in the current study had attended antenatal classes to gain knowledge, which is increasingly becoming a part of modern midwifery care. From gaining knowledge at antenatal classes many partner's encouraged the early application of TENS in labour. Their involvement in many aspects relating to TENS helped to encourage an interaction between the participant and her partner. This working together was seen as a positive way of offering support and helped the labouring woman to cope and therefore to maintain control. In the current study women said that their partners supported the use of TENS because it was a non-pharmacological method of pain control, their increased awareness of the effects of some pain control methods on mothers and babies had stimulated them to be more interested in the more natural and non-invasive methods of pain control.

The preliminary literature review (Chapter 2) found little on partner's involvement in using TENS for pain control in labour and only one study (Davies, 1989) advocated education for partners involving the application and function of TENS. Despite the pressure on the male partner to attend the birth, research evidence relating to the partner's support is sparse and relatively little is known about his experience (Dellmann, 2004), whilst it is widely recognised that the labouring woman appreciates the presence of her partner (Somers-Smith, 1999). Creasy (1997) said that there is some evidence that the father's presence, the role he plays in supporting the use of pain management techniques and the quality of the couple's relationship may reduce the need for analgesia. Melender and Lauri (2002) advocated that support from the partner strengthens the woman's feelings of safety and security in labour and thus her feelings of control.

McCrea *et al* (2000) stated that partners' support should never be regarded as unimportant since the women in their study valued it. However a more defined role, which is clearly communicated to partners and adequately prepared for may enhance support further in childbirth. Partner's support in the current study was prominent in the interviews and women found this an important aspect particularly relating to TENS use and application. The support and information obtained from the antenatal classes was different for the partners, who were reported as remembering the technical directive information for example the correct positioning of the TENS pads on the back and encouraging the early application of TENS. Broderick (2008) agreed with this and found that the partners that attended antenatal classes were better equipped to deal with the support role in labour.

Men dislike watching their partners in pain and can feel frustrated and helpless because they cannot do anything to relieve the pain (Vehvilaine-Julkunen and Liukkonen, 1998). The use of TENS in labour in the current study however was reported by the women to give the partners a focus and often helped reduce their feelings of helplessness because they were involved in the labour and pain control with TENS.

Gibbins and Thomson (2001) related coping in labour with being able to manage the pain and having continuous support from partners and health professionals. Having the support of the midwife and partner with the use of TENS for pain control in labour were both valued highly by the women in the current study. Support was shown to be a contributing factor relating to the women's external control of others, the labour event and maintaining control of the environment. The final sub-theme that completes 'control for the woman' and therefore the circular representation in Figure 5.1 is that of control of the TENS machine which will now be discussed.

5.2.3 Control of the TENS machine

There is very little mentioned in the literature regarding controlling the TENS machine and how this enhances feelings of control for women in labour. The women in this study were quite explicit about how and why they wanted to be the one operating the TENS machine or guiding that operation if their partner was involved. Women also highlighted how important TENS and the machine were in providing distraction during their labours. This, together with the physical sensation of TENS increased their feelings of security and therefore control.

TENS machines were pioneered for labour by Augustinsson *et al* (1977), who recommended the early design of specialized devices with dual channel output and 'boost' controls particularly for use by labouring women. Since then the TENS machines have become specifically designed for use in labour (Kaplan *et al*, 1998), they are small, portable, simple to operate, light, of higher intensity, have dual output and are fitted with a boost mode to increase the intensity and pulse rate with each contraction. Machines now are fitted with clips and neck straps for ease of movement and control. Although the women in the current study used several different TENS machines, most had all the 'modern' features that they needed including the 'boost' button or facility for contractions, thus ensuring that they could operate and control the machines with ease.

Rodriguez (2005) found that women liked TENS because they could control it themselves, in particular by increasing the amount of electrical stimulation received with the pain of the contractions. Controllability was described by some women in the current study as being important particularly with being able to control the actual TENS machine. Nolen-Hoeksema *et al* (2009:698) defined controllability as 'the degree to which we can stop an event or bring it about', this influences perceptions of stressfulness and the more uncontrollable an event seems, the more likely it is to be perceived as stressful. This fits in well with operating the TENS machine, varying it in order to affect its performance relating to pulse and strength seems to decrease stress, improve control and is perceived as controllability by many participants.

The TENS pulses allowed the women to concentrate on one contraction at a time, not overwhelming them with the dread of how long labour would last and knowing that the pain was going to continue which in turn controlled triggering fear and anxiety. For many women concentrating on each contraction pain, one at a time is paramount and often advocated by midwives to enhance control and focus for the labouring woman. Sadler (1997) quoted that -

'By concentrating upon *exactly* what you are doing, you will be able to cope with 'this moment', then the next moment and the next and so on, particularly when the pain is intense' (Sadler, 1997:122).

In the current study when some of the women needed to concentrate the partner was handed the TENS machine but these women retained their feelings of control as they were instructing partners on how to operate the machine with each contraction.

Knowledge can improve confidence and in turn improve the feeling of control (Gibbins and Thomson, 2001), this was true of women in the current study who needed the information relating to TENS and the TENS machines in order to use it and remain in control. Women that had a little or lack of knowledge about the TENS found it harder to use and therefore to have to make decisions in labour.

Edwards (2000) suggested that -

'Part of a woman being in control, or being able to take an active role in defining her experience of birth, was gathering information relevant to her

unique circumstances in such a way as to support her decision-making process' Edwards (2000:70).

Women therefore need to know about every aspect of TENS in order to consider it as a pain control option for labour and birth. Gaining knowledge relating to TENS and the practicalities of TENS are vital components in enhancing the control of TENS in the childbirth experience. The previous literature relating to TENS rarely considered that the women needed to know about TENS as an option for pain relief and the background to what it is and how it works. The practicalities, such as when and how to apply TENS were rarely discussed and women were 'kept in the dark' about the in depth knowledge needed in order to use TENS effectively and to its maximum potential. Six of the studies in the literature review (Erkkola *et al*, 1980; Thomas *et al*, 1988; Edwin *et al*, 1990; Lee *et al*, 1990; Padma *et al*, 2000; Crothers, 1994) purposely did not give women any information on TENS. This was referred to in section (5.2.2).

'If a woman is to better control the level of labour pain she experiences, she requires accurate, research-based information in a form suitable for her to use when and where she is ready for it. Only when these requirements are satisfied will the woman and those who are with her be able to work together to return, or give, the control of pain in labour to the one to whom it rightly belongs'

(Mander, 1992).

In a recent UK study (McMunn *et al*, 2009) all of the maternity units (n=139) surveyed stated they provided women with information on TENS, however few provided any training for women on the application of TENS. Only one unit gave instruction on when and how to use TENS, the remainder said that they provided practical instruction when women were admitted to hospital. Similarly, all of the maternity units said that they supported the use of TENS but only 7.9% of the midwives had any training on TENS, which has relevance for the future use of TENS for women and identifies an urgent need for the training of midwives. Some of the maternity units in England have TENS (17.9%), but most rely on women themselves hiring them from TENS manufacturers. If women are not informed about TENS until admission to hospital they do not have a chance to use the TENS machine early in labour when at home or familiarise themselves and their partners with the machine before labour starts. The women in the current study became familiar with the TENS machine before their labours started and used TENS well at home and

TENS was used as a sole form of pain control by some women birthing at home and in hospital.

As TENS is a form of pain control that can be applied and used at home it is extremely important that the women and her partner understand exactly how to use the TENS unit effectively and safely. Time can be provided at antenatal classes, providing advice and guidance as required using talks and demonstrations in a sensitive and relaxed way (Davies, 1997). The value of antenatal preparation generally has been advocated by many (Russell *et al*, 1997; McCrea *et al*, 2001; Gibbins and Thomson, 2001).

Some women in the current study used a combination of sources to obtain enough knowledge in order to make an informed decision of whether to use TENS in labour. Some women had used TENS before, obtained TENS and informed their midwife that they were going to use it. Women often tried TENS before labour which helped during labour with the application and confidence of knowing what to do and how to apply TENS. The women that did not know they could use TENS before labour and become familiar with it regretted not trying it and would do so in future use. Midwives therefore need to inform women to familiarise themselves with the TENS and its application and use prior to labour as part of their preparation.

Many women had the knowledge relating to early application of TENS and endorphin production and women expressed that if the midwife explained that TENS could be used this way they took notice. Previous experience affected the knowledge base and TENS was often used more widely, for instance for back ache during late pregnancy. Two women were well informed due to their healthcare background and were both looking for a non-invasive non-pharmacological form of pain control and used TENS well in labour and birth.

Van der Spank *et al* (2000) recommended that all women are taught how to use TENS apparatus and all should experience TENS stimulation prior to labour. The current study agreed and found that women who practiced with the TENS felt more at ease, were confident with TENS use and application in labour and would definitely ensure they did the same in subsequent labours. Women who did not practice with the TENS retrospectively wished that they had tried TENS before labour and thought that this was a good idea for the future.

The fact that women can easily operate the TENS unit themselves may partly explain its popularity and as Dowswell *et al* (2009) highlighted the TENS unit may be used on a variety of settings. Dowswell *et al* (2009) suggested that TENS could be helpful to women at home to manage pain in early labour and could in fact delay hospital admission, which in turn has an impact on intervention, midwife time and costs. Dowswell *et al* (2009) advocated that women should have the choice of using TENS in labour if they think that it will be helpful. This was highlighted in the current study, many women felt comfortable, calm and in control and stayed at home for as long as possible in labour using the TENS and often arrived at the hospital in advanced labour without needing intervention.

In the current study women found that the TENS machine did not need to be removed immediately after the birth or at any time throughout the labour. Instead, it made sense to these women to ‘wean off’ the TENS after the birth. TENS was continued and was found to be helpful for delivery of the placenta, suturing, and for after pains for some women.

TENS was recommended for early labour only by the National Institute for Health and Clinical Excellence (NICE, 2007) guidelines. These guidelines have been questioned by many and have been challenged by Dowswell *et al* (2009) and McMunn *et al* (2009) who found that the guidelines were not followed by all midwives. Midwives supporting women who choose to use TENS for pain control have found that TENS can be effective throughout labour. The current study shows that, not only do many women use TENS in early labour but many also use TENS throughout the duration of their labour. Some women use TENS as part of a combination of pain control however for many women TENS is used as a ‘sole’ form of pain control. Using TENS as a ‘sole’ form of pain control has been particularly useful for women having rapid labours, who increased the intensity of the TENS themselves quickly to achieve the maximum pain control in a short time. The women who had rapid labours often did not have time for other pain relief but had started using TENS at home and continued in hospital until the birth.

The current study details the practicalities of TENS in depth, women discussed issues such as access of TENS, types and details of TENS machines, the operation of machines, cost issues, instructions for TENS application, physically applying the TENS pads, difficulties with the wires of some TENS machines, versatility, time period for TENS to take effect and other uses that TENS was used for after the birth. Very little relating to this could be found in the literature on TENS, therefore new insight into the importance of these practicalities was uncovered.

The accessibility of TENS varies considerably within localities and is not equitable locally or nationally (McMunn *et al*, 2009). The women in the current study used a variety of ways to access TENS machines and were able to obtain TENS for use in labour very easily, some borrowed, hired, loaned and bought TENS units. The cost was mentioned by the women and they generally thought that TENS was cheap. It was highlighted that TENS should be available in main hospital units for hire or loan.

According to Buckley (2004) safety has meanings beyond mortality and morbidity in this instance, it refers to a degree of emotional comfort and psychological safety. Buckley (2004) said that anything that disturbs a labouring woman's sense of safety and privacy will disrupt the birth process. Feeling safe and secure therefore is important in order to allow normal labour and birth to progress. This was articulated by the women in the current study, they felt safe with TENS because it is non-invasive and is not affecting the baby, they felt calm and relaxed and secure with having the TENS machine to hold and operate (as previously mentioned in 5.2.1).

Feeling safe with the TENS was expressed as equally important to those women having hospital and home births in the current study. Security as a human value means harmlessness, confidence, certainty and calmness and promotion of security helps to prevent or dispel fears and is enhanced by support from professionals and partners in labour and birth (Melender and Lauri, 2002). Kirkham (2000) stated that -

‘Feeling safe enables us to achieve our maximum potential, either as mothers or as midwives. Where there is threat (the opposite of trust), we are inevitably defensive, rigid, unable to give and clinging to the power we have’

(Kirkham, 2000:242).

Safety cannot be accepted as being entirely a matter for professional judgement, feeling safe and secure is entwined with feelings of confidence, trust and feeling in control. In the current study, women expressed feeling safe and secure as a way of describing how they felt with using TENS for pain control in labour. Anderson (2000) demonstrated the relationship between safety and trust as ‘feeling safe enough to let go’. According to Kirkham (2000) midwives need key skills in order to sustain relationships that help women to feel safe. In the current study feelings of safety and security were linked to distraction which also affected the woman's feelings of control when using the TENS machine.

Five studies in the TENS literature review mention the distraction element of TENS briefly but do not go into detail (Davies, 1989; Grim and Morey, 1985; Robson, 1979; Stewart, 1979; Van der spank *et al*, 2000). The current study participants (12/20) felt that TENS was a distraction from the labour pain, and by physically operating the TENS machine, it was possible to divert the woman's attention or take her mind from the contraction pain. TENS was described as allowing concentration, promoting calmness and often 'blocking the pain'. The 'gate control theory' comes into play here as discussed in Chapter 1. The electrical waves from the TENS seem to impair the transmission of painful stimuli from the periphery to the central nervous system. Melzack and Wall (1965) state that these electrical waves produce sensory inputs and inhibit pain signals by closing the "gate" in the spinal cord. In parallel to this, TENS elicits physiological changes in the central and peripheral nervous system that can be linked to analgesic effects. The production of enkephalins (opioid like substances found in the brain) and endorphins (morphine-like substances occurring naturally in the body) both have an analgesic effect and could contribute to the distraction from the pain.

For many women in the current study TENS was seen as 'masking the pain' so that when the TENS machine was turned off, the physical sensation was missed and they realised that they were in a lot more pain than they had thought and needed the TENS turned back on immediately in order to continue to cope and maintain control. Miller Jones (1980) also found that when women were asked to turn the TENS off for a couple of contractions, they requested that it be turned back on immediately. Still consistent with deep relaxation and meditation, the level of distraction of TENS was particular for each woman and was seen as allowing space and 'letting the brain think' by a kind of disassociation from the body.

The sensation of TENS also helped by creating a diversion from the contraction pain by providing something to 'focus on', suggesting that the distraction was seen as more important than complete pain relief. The distraction provided by TENS formed one reason for future use of TENS for many women, it enabled concentration and maintenance of control and was seen as acting as a diversion from the physiological sensations of what was happening within the body.

The physical sensation of TENS was important and verbalised by all of the women in the current study. Moore and Holden (1997) found that all of the women commented on the distraction element of the stimulation of the TENS and the importance of varying it in labour. The variation in the physical sensation between the 'pulses' and the 'boost facility'

of the TENS machine contributed to the distraction and were important to the women in the current study. The ‘boost facility’ or ‘burst mode’ (continuous rather than pulsing) was very important to the majority of women in the current study, who used the boost during the contractions. Some women waited for each contraction in order to use the ‘boost’ because it felt more comfortable and they preferred the continuous feeling rather than the pulses, others used the continuous mode throughout labour. The strength of the levels of the TENS and the fact that TENS can cause discomfort were articulated, women advised when using TENS to gradually increase it.

Control of the TENS machine is dependent on knowledge preferably during the antenatal period. Both the woman and her partner value being well informed, not only about the practicalities of TENS and hiring modern TENS machines but how the sensation or distraction can contribute or enable control for the woman in labour. Control of the TENS machine was supported by partners and midwives for the majority of women who found this useful. Figure 5.1 clearly outlines how these themes are closely related and reminds us that ‘women in control’ are central to their experiences of using TENS in labour.

5.3 Summary of Discussion

Control has been given primacy in this study after emerging as a super-ordinate theme. It acted as a magnet pulling all of the other inter-related and inter-dependent themes in and was found to be central to the women’s experience of labour.

In order to examine and discuss the concept of ‘control’ for women in labour and birth, it was important to look more closely at the two paradigms or belief systems within midwifery care. The first paradigm is that of the medical model (Heinze and Sleigh, 2003) of care where women are often passive, fearful and anxious, do not want to feel pain and prefer to hand over control to the professionals to make decisions for them. The second paradigm is that of the more natural model of care (Green *et al*, 1998) where women want to manage themselves, they are generally more calm and relaxed, they want to actively take part in their labour and want to be in control of themselves, others and the decisions made. It is important to understand that although these two paradigms or belief systems are at two opposite ends of the spectrum, there is a vast continuum between them. The women in the current study have beliefs more in line with the natural belief system, they wanted to be actively involved in their care and maintain control of themselves, others and

the birthing environment. They preferred to follow the normal pathway in labour without using pharmacological analgesia which allowed them to be more mobile.

The choices of analgesia for use in labour and birth will vary for women who have different beliefs particularly with reference to how much control they want to maintain in labour (Green *et al*, 2003). Women have pre-existing beliefs, which are then changed as they acquire more knowledge and information during pregnancy. This is often dependent on the degree of knowledge they require or seek and whether they want to be passive or take an active role in their birthing experience. Women's different beliefs about the pain relief choices available and the type of labour that they want, affects their expectations and therefore their satisfaction with their experiences of childbirth.

Midwives views, ideas and beliefs are shaped by their own experiences and practice as well as having to practice within these two belief systems and the vast continuum between them. This is not a simple task as beliefs are also shaped by society and what the maternity service is expected to provide with its guidelines and policies to guide practice decisions. Midwives need to provide the right level of support in line with women's choices of analgesia and to support women who want to maintain their own control in labour or relinquish it. Midwives need a sound and up-to-date knowledge of all pain control methods, including TENS (McMunn *et al*, 2009) in order that they have the knowledge to provide evidence-based information to women to ensure that they have realistic expectations (Scapiro *et al*, 1998). Midwives support during the antenatal period and in labour is vital for women particularly in order to support the notions of control and to provide realistic expectations for childbirth and improve experiences for women in labour and birth (Lally, 2008). If women want to feel in control of themselves, others around them including professionals and their environment this should be supported. Partners have a very important role to play and their support in labour is valued by women and its importance should not be underestimated.

In the current study women's preference was to use TENS as a mobile, non-invasive, non-pharmacological pain control method as a part of their belief system. For some this also included combining TENS with other coping strategies such as relaxation, meditation and mobilisation in order to promote a more natural birthing experience. Control for these women went beyond simple decision-making (McCrea *et al*, 1999) since it involved them actively engaging by 'operating' their pain control mechanisms. It was important for these women to have a good and sound practical knowledge regarding TENS and its background

in order that they could have the information to assist in the use and application of TENS appropriately.

Control must remain with the woman if that is her choice. In the current study, the majority of women expressed feeling pleased with how they managed labour and pain control with TENS. Part of their positive experiences they attribute to the use of TENS for pain control. The current study demonstrates how control promotes normality in labour for women, which in turn may lessen the chances of intervention in labour and increase women's chances of having a positive and fulfilling experience.

The experiences of women in the current study have identified that control is a major contributing factor to the whole context of normal labour and birth experience and one in which TENS played a large part for them. TENS facilitates or promotes the multi-dimensional factors of control that enhance normal physiological labour and birth.

Having summarised Chapter 5, I now move on to the final chapter of the study where the limitations of the study will be addressed, recommendations for practice, education and research will be identified and the final conclusions will be drawn.

6.1 Introduction

Whilst this study partially confirms the findings of earlier TENS research it offers new insights into and a much deeper exploration of women's experiences of using TENS for pain control in labour and birth. Gathering participants' experiences exposed in-depth information that could not have been revealed by the quantitative research designs previously used to study TENS.

Seeking the consumer perspective is vital within healthcare in order, as was the case in this study, to determine what is important to them. Whilst this study focuses on the idiographic perspective of each individual and sees the importance of every woman's experience this approach to IPA also allows claims to be generated for the group of women who participated in the study. As a result of completing this study recommendations are made for the use of TENS within contemporary midwifery practice; the education of midwives, women and their partners; and research.

Following on from a summary of the women's experiences of using TENS for pain control in labour the limitations and recommendations for practice, education and research are set out below - these are based on my personal understandings gained from interviewing the study participants about their experiences of TENS and examining their accounts in relation to the literature. The rich description that this study provided allowed me to identify similarities and differences in the experiences of women using TENS for pain control in labour: it also stimulated critical reflection and a sense that there was a need for further enquiry relating to TENS use in midwifery practice. Following the drawing together of recommendations for midwifery practice, education and research the chapter closes with concluding remarks.

6.2 Women's Experiences

Many women in the current research study expressed enjoying the labour and birth experience, were proud of what they had accomplished and the overall birth experience was positive for the majority. The factors that contributed to these positive feelings were detailed in the super-ordinate theme of 'control' including women's control of self, others and the environment along with being able to control the TENS unit itself (control box),

‘support’ antenatally and in labour from midwives and their partners, having a ‘normal birth,’ including being mobile, being able to labour in or adopt the positions that their body needed to be in and using TENS as drug-free pain control.

Gaining knowledge and skill related to the practicalities of application and use of TENS for use in labour was vital in order to maintain control, offer choice and support to the women for labour and birth. The ‘distraction’ element of TENS was important in allowing the woman to feel safe, secure, have a diversion from the pain although being able to feel the physical sensation was a key factor. Overall the women had belief and confidence and therefore ‘trusted in’ TENS for pain control in labour. This enhanced women’s overall satisfaction with the experience of labour and birth which is shown by nineteen out of twenty women verbalising a feeling of elation and enjoyment of their experience and over two thirds (70%) of women have said that they would use TENS again in future labours. The studies in the literature review, even if negative or inconclusive, highlighted that women liked TENS and would use it again. Many participants have already recommended TENS to other women and would like their experiences of using TENS for pain control in labour to help other women.

In the current climate within midwifery the increasing intervention rate is having a knock on effect with the increase of epidural anaesthesia followed by an increase in instrumental delivery and caesarean section, the focus urgently needs to be re-aligned to ‘normalising labour and birth’ for women. This has implications not only on the woman but on the partner and the whole family unit. It is paramount for midwives with the skills in normal birth that have faith in women’s bodies to do what is for many a natural process, to impart their knowledge to midwives that have become ingrained in the technocratic, high risk, interventional way of midwifery often seen on labour wards today. It is accepted that TENS is not a pain control option for all women and that some women are high risk from the beginning of their pregnancy, however, where possible midwives and obstetricians need to involve the woman in decisions and choices in order to give women the ‘control and support’ to maximise the possibility of making the whole labour and birth experience a positive one. This section concludes with two quotes from the current study highlighting how women felt about their experience -

‘I couldn’t have asked for a better labour, I had a very positive birthing experience’ (19.8.8).

‘It was a really lovely experience’ (18.5.39).

6.3 The limitations of the study

All research studies have some limitations: the following have been identified in relation to the present study. Firstly, the study used a particular group of women, at a particular time, within a specific geographical area, therefore it can only make claims for individual women and for the larger group of twenty women and cannot be generalised to the whole population of women in labour. The findings from the study may however have transferability to similarly mixed groups of women using TENS in similar contexts. The knowledge acquired in this study context may be relevant to other women using TENS. Secondly, the study focused on low risk women and excluded high risk women who may have used TENS. The selection of the sample pre-labour and birth of women intending to use TENS could have addressed this issue. Thirdly, the research technique of using Interpretative Phenomenological Analysis worked well and involved a thorough analysis and interpretation of the data, however it generated a vast amount of data which was difficult to analyse within a limited time frame.

6.4 Recommendations for practice, education and research

The recommendations stemming from this research, and the contextualisation of the study within the evidence base, are clustered around three areas - midwifery practice, education and future research. Each is presented below and will be achieved, in the main, through widespread dissemination of the findings of this study in conference presentations, journal papers and workshops.

6.4.1 Midwifery practice

- Midwives need to be made more aware of the positive relationship between control in labour and birth and TENS in order to enhance or enable normal birth for women.
- NICE guidelines (2007) should be reviewed in light of the findings of this study which highlight the usefulness of TENS throughout labour. Despite the guidelines recommendation to limit the use of TENS to early labour women and midwives are, in practice, still using TENS throughout the first and second stages of labour.

- Midwives need to be supported by their managers to continue to provide one-to-one care in labour. One-to-one care assists midwives in supporting women using TENS in labour and therefore has the potential to further develop their feelings of control.
- Midwives need to consider the use of TENS in relation to the birthing environment. The women in this study found using TENS enabled them to remain mobile and change posture easily thus promoting normal labour and birth. The use of low risk delivery rooms with homely surroundings and birthing aids such as birthing balls, bean bags and mattresses should be promoted alongside the use of TENS.
- Maternity units need to devise hire or loan schemes for the most up-to-date TENS machines to meet the demand from women. Midwives need to know their local hospital's arrangements for hiring TENS machines.
- Midwives should encourage women using TENS to remain at home for as long as they feel comfortable. Remaining at home in their own familiar environment, relaxed and feeling in control of early labour may reduce women's chances of having unnecessary intervention, pharmacological analgesia and may reduce costs to the maternity service.
- Midwives should encourage and support the use of TENS on its own or in combination with other more natural or holistic methods of pain control such as relaxation and meditation. In this study TENS was used successfully as a 'sole' and complementary form of pain control for women.

6.4.2 Education

6.4.2.1 Education relating to women

- It is necessary to standardise information given to women relating to TENS. All women should have access to appropriately presented information via leaflets during the antenatal period. The information given to women relating to TENS has been shown to be inequitable locally (through this study) and nationally (through audit and literature).

- Midwives need to ensure that TENS is routinely discussed at antenatal classes with women and their partners. This is particularly important for women who have a preference for using non-pharmacological analgesia and want a ‘drug free’ labour. Women who have used TENS should also be encouraged to talk to other women about their experiences as part of these classes.
- Women interested in TENS as an option should have access to an individual education session to give them further knowledge and allow them to experiment with the TENS machine (women should not apply the TENS machine before 37 weeks gestation). These sessions should also include the partner. The findings from this study emphasise the importance of the partner’s involvement in the application and use of TENS enabling the couple to work together effectively.
- Women need to know how to access newer machines specifically designed for labour and that they are powerful enough to provide the intensity needed for all stages of labour.

6.4.2.2 Education relating to the midwives

- All midwives need annual mandatory continuing education about TENS: they should be certified proficient and knowledgeable at the end of each course. This should include knowledge of the newer TENS machines that are specifically designed for labour and birth. A recent UK audit (McMunn *et al*, 2009) showed that midwives have little training on TENS (7.9%) effectively meaning that 92% of midwives do not. Some women in the present study commented on receiving inadequate knowledge from their midwives.
- All students during their midwifery training need TENS to be included in their formal education and updated annually.
- Audits are needed in each Trust to assess the local use of TENS and training opportunities that are currently available in order to determine local needs for the future.

6.4.3 Future Research

I have made suggestions below for further research in order that TENS may continue to be explored and its future direction considered. In making these suggestions I am mindful that ‘we do research with women and not on women’ for their views and experiences to be part of the future agenda in midwifery (Maternity Matters, 2007; Midwifery 20:20, 2010).

- The current study could be replicated in different areas in order to compare the findings of this study for consistency and transferability to other groups of women.
- Future research focussing on midwives’ experiences of using TENS with women and their partners would be both useful to midwifery practice and the planning of future midwifery care. Studies designed to investigate this should adopt a qualitative approach which provides rich in-depth evidence.
- In-depth research using different inclusion criteria to the present study, for example interviewing more high risk women, particularly women who start off low risk and become higher risk as labour progresses is needed to understand better how TENS is experienced. There is evidence (Chapter 2) that high risk women who have used TENS for pain control in part of their labour have assessed it favourably.
- TENS was found (Wang *et al*, 2007) to naturally increase uterine contractions and accelerate labour. The use of TENS could therefore potentially decrease the intervention of induction of labour and augmentation of labour. More research is needed to determine the potential of this new way of using TENS.
- Partners have been rarely mentioned within the literature on TENS (Chapter 2) however they were reported as a prominent feature within this study. Future research is needed to explore their experiences.
- Some women in the present study used TENS as a ‘sole’ form of pain control: more needs to be known about the frequency and success of this approach.

6.5 Conclusions

The findings of this study have broadened our understanding of women's experiences of using TENS for pain control in labour, why they used it, why they found it helpful, why they would use it again and what would make their experiences better. These experiences were connected to feeling in control during labour and a wish for normality. Using TENS built up their confidence, trust and belief in themselves, the TENS machine and their partners. In order to enhance their confidence they acquired knowledge and support to control the machine, either by themselves or through their partners or birth companions, this in turn provided them with the right level of distraction and sensation for their labours. Never before have women's experiences of using TENS in labour been described in such detail and as such the findings from this study are worthy of consideration, particularly at a time of increasing intervention and rising caesarean section rates coupled with cost constraints.

The current study removes TENS from its scientific technocratic era of rigorous randomised controlled trials and other quantitative studies that focus predominantly on assessing effectiveness through the use of pain scales: these studies rarely considered the woman and her experience or placed TENS in the arena of natural and normal childbirth. The present study has shown that women using TENS feel in control of themselves, others including professionals, their environment and the actual TENS machine itself.

Much of the previous research literature on TENS highlighted that women liked TENS and assessed it positively. The present study, with its focus on women's experiences, goes beyond these older studies by providing a more in-depth understanding of what using TENS in labour actually means for women and to a lesser extent their partners and birth companions. For the women in this study it meant being in control. The findings suggest that the women wanted midwives to strengthen their experience of control by providing support, increasing her knowledge to allow, not only an informed choice to be made about the use or not of TENS but also about when to use TENS and how to use the TENS machine to her best advantage: all of these things enhanced her feelings of confidence, her belief and therefore trust in herself and her ability to birth her baby as and where she chose.

Throughout midwifery and lay childbirth organisations, the idea of 'normal birth' is being debated and promoted as never before (Darra, 2009). National and international guidelines which underpin maternity service provision encourage 'normal' birth practices (WHO,

1997; NCT, 2007; NICE, 2007a) with an underlying aim to reduce costly interventions in birth. Professional midwifery groups (RCM, 2004) are also actively trying to preserve ‘normal’ birth. Furthermore, the International Confederation of Midwives updated their definition of the role of the midwife, which was endorsed by the World Health Organisation, and they included ‘promotion of normal birth’ as a key part of the role (ICM, 2005).

Whilst I acknowledge the limitations discussed previously in section 6.3, this study has uncovered a group of women’s in-depth experiences of using TENS for pain control in labour and has therefore filled a “gap” in the knowledge base identified in Chapter 2. In addition the findings suggest that TENS was identified as an ‘enabling mechanism’ for the woman to be in control of a normalised birth. Women were able to maintain their independence, make decisions and *actively* take part in their pain control using TENS.

APPENDIX 1

Search Strategy

Sources.

The literature sources included the clinical databases for MEDLINE, CINAHL, BNI, EMBASE and the COCHRANE Library. Reference lists were used and relevant articles were accessed. Other forms of searching evidence were used such as MIDIRS, BJM, and NICE as shown in Table 2.1 (Chapter 2).

Time Span.

For the purpose of this study which was to review the literature on the use of TENS in labour, the literature search needed to include relevant older key texts and historical studies as well as current ones. Studies included therefore span from 1977-2009.

Language.

National and International literature was accessed, however, the search strategy was limited to studies published in the English language. The practicalities and preservation of the meaning of text through translation support this even though it is acknowledged as a limitation of the search strategy.

Keywords.

The key words used for this preliminary literature review were 'Transcutaneous electrical nerve stimulation', 'TENS', 'Labour', 'Labour pain', 'Pain relief/control', and 'Women's experiences'. The key words were combined to narrow down the search. Editorials and professional commentary or opinion papers were excluded.

Type of studies.

Systematic reviews, Randomised control trials, Non-randomised control trials, Qualitative and Quantitative studies.

The literature reviewed (in relation to the themes generated by the study).

A literature review has also been carried out using a similar search strategy and substantiated keywords in relation to the super-ordinate theme, main themes and sub-themes in order to support the findings and form the discussion in chapter 5.

APPENDIX 2

Search History

SOURCE	ARTICLES IDENTIFIED	ARTICLES ASSESSED	DUPLICATES	INCLUDED
MEDLINE	70	25	4	7
CINAHL	42	20	3	8
BNI	6	5	0	5
EMBASE	75	24	4	6
COCHRANE	2	2	0	2
REFERENCE LISTS	4	4	0	2
TOTAL	199	80	11	30

APPENDIX 3

Summary of Included Studies

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
1. Augustinsson <i>et al</i> 1977	n = 147	Quantitative study Questionnaires used.	44% considered pain relief to be very good, 44% to have moderate effect, whilst 12% considered TENS without effect. Considering good results and no complications TENS recommended as a primary pain relieving measure and prompted early design of specialized obstetric devices with dual channel output and 'boost' controls. First study pioneering the use of TENS for labour pain.	Limited mobility of women as fetal heart rate monitors, intrauterine catheters limited the woman's movements in labour. Authors comment that consciousness of the woman was not influenced and that she can actively take part in labour and experience the delivery. High risk women were used in the sample, namely induction of labour, post-term and women with toxæmia. Important study as pioneered the use of TENS for labour pain.
2. Bortuluzzi 1989	n = 30	Quantitative study Questionnaires using a pain rating scale.	Aimed to assess practical aspects and effectiveness of relieving pain. Results showed a high level of patient and staff satisfaction and a statistically significant change in pain perception when subjects acted as their own controls. 75% rated a decrease in pain with TENS, 21.5% rated no difference and 3.5% rated TENS negatively. Less pethidine was used with TENS group.	Study recommended that information be provided to midwives and clients on TENS as analgesia, and that it should be available as a choice on labour wards. A physiotherapist was involved in the application of TENS in labour. Midwife and woman filled in questionnaires within 24 hours of delivery. Application and operation of TENS unit was simple.
3. Bundsen <i>et al</i> 1981	n = 24	Quantitative study Randomized study using control group.	Compared induced labours of TENS group and control group. Less analgesia was used in the TENS group compared with the control group. Course of labour, uterine activity and fetal heart rates were similar in both groups, as were apgar scores and neonatal bloods. All newborn infants were in good condition and no significant differences between the two groups could be demonstrated.	Only induced labours were included which puts the sample in a higher risk category. Less analgesia used in TENS group, which is an advantage for women preferring to use minimal analgesia in labour. TENS did not affect the fetal heart rate (even though TENS pads were applied to the suprapubic region), apgar scores and all of the newborn infants were in good condition. Small study, however expresses favorable results for the TENS group.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
4. Carroll <i>et al</i> 1997	n = 877 total women from all studies	Systematic review of 10 RCT's, 436 received TENS and 441 acted as controls (sham TENS or no treatment).	TENS does not relieve labour pain. No significant differences reported for prospective primary pain outcomes in any of the ten studies. Three studies reported significant differences between active and sham TENS for secondary pain outcomes. Recommendations – TENS has no significant effect upon labour pain and women should be offered effective interventions.	Only quantitative studies (RCT's) included. Have not included the views of women on TENS. Study assumes that TENS is a treatment for total pain relief and not pain control. Conclusions could contain bias as have only looked at RCT's. Conflicts with clinical experience. The intrapartum NICE guidelines (2007) for the use of TENS have been made on the recommendations of this study.
5. Chao <i>et al</i> 2007	n = 100	Randomised double-blind placebo controlled trial. Looking at the application of TENS to acupuncture points to relieve labour pain.	Willingness to use TENS for future childbirth was significantly different, 98% in the TENS group versus 66% in the TENS placebo group. Recommended that TENS could be a non-invasive adjunct for pain relief in the first stage of labour. Neonatal outcomes were no different in each group.	Very important, recent and significant study which found significant differences. Robust research and recommendations for TENS to be considered for use as pain relief in the first stage of labour.
6. Chia <i>et al</i> 1990	n = 101 part 1 n = 20 part 2	Quantitative study Using pain scales Compared TENS to Entonox.	Results showed that both TENS and Entonox could be used in labour for up to 5-6 cms cervical dilatation or the frequency of contractions was nearly 5 in 10 min or the first 3-4 hr from the time the patients first requested pain relief in labour when frequency of contractions was nearly 4 in 10 mins. TENS could be used in early labour for patients who wish to be ambulant and TENS is as effective as Entonox. Either modality was not adequate for pain relief throughout labour.	TENS only used for some of labour and considered inadequate for the whole of labour. 47.9% of TENS group were induced, which infers that they were higher risk and perhaps not mobile. Acknowledgement that TENS could be used for patients who wish to remain mobile in labour. The second part of the study used primps only as the sample and all patients underwent surgical induction so that labour could be observed from the start. This appears biased and again limits mobility.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
7. Crothers 1994	n = 60	Quantitative study Random allocation to 3 groups: TENS, placebo and Pethidine and Phenergan. Pain questionnaire used.	Three groups used with random allocation to each 1.TENS as a first method of pain relief, 2. TENS placebo unit and 3. Pethidine and phenergan group. No differences were shown in the three groups regarding the effect of different modalities on pain levels and 50% of all women reported having moderate to good relief from all three methods of pain relieving intervention.	Uncomplicated primigravidae women who were ignorant about TENS and its effects were used for the sample. This infers that women's choice was not a consideration or antenatal education was purposely not offered. Multipgravidae women were not included. Questionable results finding all three groups the same with regard to effect from pain relief. TENS allows women to view their pain differently. Importance of antenatal classes.
8. Davies 1989	n = 50	Quantitative study Small survey using simple pain scale rating and a questionnaire with a face-to-face encounter similar to a structured interview.	TENS reduces the time spent on delivery suites for women. TENS used as first form of pain relief. Used TENS in combination with pethidine and entonox or both. 49 out of 50 women would like to use TENS again in labour. Good results and no known complications and recommends TENS as an initial form of pain relief to which pethidine or entonox can be added in needed. (higher risk sample were used such as induced labours, twins and fetal scalp electrodes used to monitor babies).	Comments that women are questioning the effect of pain relief on themselves and their babies. Importance for women of the ability to control ones own pain relief. Excellent antenatal education for midwives, students and partners involving the application and function of TENS and recommend that Midwives have instruction on the correct positioning and application of TENS. Particular sample were often internally monitored due to hospital policy and fetal scalp electrodes applied to baby, therefore mobility could be restricted. Distraction element commented on by all women.
9. Dockter <i>et al</i> 2004	n = 13	Quantitative Case series Pain recorded on visual analogue scales and questionnaires used.	Women reported moderate pain relief from TENS. Only two women used TENS throughout the labour and delivery process (15%), however 10 reported moderate pain relief in early labour while TENS was used. Results do not support the use of TENS for pain relief throughout the entire labour and delivery process.	Recommends further research studies needed to examine the trend of early labour pain relief found in women who use TENS during labour and delivery. 9 women out of 13 were induced and therefore higher risk, 11 out of the 13 women received epidural analgesia in labour. 10 out of 13 women were primigravida, (only included 3 multigravida), however this was acknowledged. Study is biased towards high risk sample and does not therefore look at a fair selection of cases.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
10. Dowswell <i>et al</i> 2009	n = 1671 total women from all studies	Large review 19 studies (25 in total with 6 excluded) Included all randomized control trials.	Fifteen studies examined TENS applied to the back, two to acupuncture points and two to the cranium. Overall there was little difference in pain ratings between TENS and control groups, although women receiving TENS to acupuncture points were less likely to report severe pain. The majority of women using TENS said they would be willing to use it again in a future labour. TENS did not seem to have an effect on the length of labour, interventions in labour, or the wellbeing of mothers and babies.	It is not known whether TENS would help women to manage pain at home in early labour. The authors suggest that although it is not clear that it reduces pain, women should have the choice of using TENS in labour if they think it will be helpful. The experience of pain is complex and for whatever reason some women find TENS helpful. All of the studies included recruiting women after admission to hospital, we do not know whether TENS would be helpful to women at home so as to delay hospital admission. Challenges NICE guidance and Carroll <i>et al</i> (1997).
11. Edwin <i>et al</i> 1990	n = 125	Placebo controlled, double blind study, with random allocation. Pain recorded on visual analogue scales and questionnaires used. Non-parametric test and chi-squared values calculated.	Evaluated the effect of TENS in the management of labour. Low risk sample were randomly divided into 3 groups. No interference occurred with electronic fetal monitoring and no effect on fetal heart rate. Normal delivery rate the same with TENS. TENS was seen as a compliment to conventional analgesia not an alternative.	Sample of women chosen had not attended antenatal classes, therefore it was assumed that they had a lack of or no knowledge regarding TENS. Electronic fetal monitoring used which limits mobility and freedom in labour. TENS was seen as an addition to conventional analgesia not an alternative.
12. Erkkola <i>et al</i> 1980	n = 200	Quantitative study Sample=100 women that had used TENS and 100 randomly selected comparison control group and pain questionnaires used.	The TENS group rated their pain higher than the control group and they used more analgesia. Despite this 86 (%) of the TENS group judged TENS to have provided good or moderate pain relief.	Results seem to be conflicting and minimal detail given of how the study was conducted. Sample biased as more of the TENS were group were induced with oxytocin, had more intense pain and were not therefore ambulant. TENS was also started when labour was intense. Women judged TENS favorably. Even though early negative study, it acknowledges that TENS is ambulant, safe, simple and cheap. The sample had no prior antenatal knowledge of TENS and study.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
13. Grim and Morey 1985	n = 15	Quantitative study Questionnaires and a pain rating scale used along with descriptive statistics.	TENS provided some relief to 87% of participants, 20% reported excellent relief. Participants expressed willingness to use TENS again. Distraction element was found. Improved ability to concentrate with use of TENS and made use of breathing and relaxation techniques. Additional analgesia was reduced.	Study participants were chosen by the consultants and it was the Obstetrician who allowed TENS use. Midwife operated the unit under the patients' direction. Good results found with using TENS, in particular the ability to concentrate, using breathing techniques, relaxation and the distraction element which all help to maintain control. The majority of participants reported some relief from TENS and would use it again.
14. Harrison <i>et al</i> 1986	n = 150	Quantitative study Random allocation to a double-blind placebo-controlled study. Pain rating scale and Chi-squared test and Cox's model for survival analysis used.	TENS and entonox group were significantly less likely to require further analgesia than those treated with placebo TENS and entonox (this was not actually being tested). Highly significant differences were found between TENS and TENS placebo groups in terms of favorable and unfavorable comments by mothers and midwives. The use of epidural was lower in the TENS group.	Evidence from consumer satisfaction for TENS suggests that it has a part to play in analgesia in labour but highlights that there is a need for apparatus more specifically designed to cope with the most intense of labour pain. Early study acknowledging that development of TENS machines needed. Women were less likely to use epidurals or other analgesia if they had TENS.
15. Hughes <i>et al</i> 1988	n = 89	Quantitative study Random allocation to 3 groups- TENS (29), placebo (30) and control group (30).	93% of TENS group versus 62% placebo group achieved good to excellent pain relief during labour with the TENS device. Based on the staffs' assessment 81% of TENS and 43% of placebo group had good to excellent analgesia. Of the patients that had the active TENS 93% said that they would use this again compared with only 59% of patients in the placebo group. Patients using a functioning TENS device had significantly more pain relief than those using a placebo device.	There was a high degree of maternal acceptance with the TENS device than there was with an epidural and the use of narcotics. TENS provided some analgesia for labour, may decrease narcotic requirements and be a useful alternative for analgesia during labour. TENS may prove to be a good first choice in patients seeking less intervention in labour and delivery. A high proportion (93%) would use TENS again.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
16. Johnson 1997	n = 10,077	Quantitative study Large questionnaire survey, analysed using descriptive statistics.	71% reported excellent or good pain relief 91% would use TENS again 14% used No other form of pain relief and 83% of these reported good or excellent pain relief. Results suggest that some degree of pain relief occurred during TENS administration whether due to true analgesic effect or placebo cannot be determined.	Only study that asks women themselves for satisfaction rating and relates to women's experiences and aims to provide information on patient satisfaction, this important factor being overlooked in most other studies. Highlights that the potential value of TENS for pain control in labour is often overlooked.
17. Kaplan <i>et al</i> 1998	n = 104	Quantitative study Pain score questionnaires and statistical analysis used.	TENS reduced labour duration in 1 st stage of labour and reduced amount of analgesic drugs administered. No side effects on mothers and newborn infants and is cost effective. Looked at a specific TENS machine. 72% primips and 69% multiparae considered TENS effective, 67% and 69% respectively would use TENS again 65% considered TENS as effective as any other pain relief they had used before.	Researcher was searching for a safe alternative to pharmacological pain relief for use in labour. TENS was highlighted as an effective non-pharmacological, non-invasive pain relief for labour and delivery. Researchers recommended improvements in TENS devices to cope specifically with pain in labour.
18. Labreque <i>et al</i> 1999	n = 34	Quantitative study Self evaluation by women of pain using visual analogue scales. Women's evaluation of control and satisfaction were assessed using adapted versions of the Labour Agency Scale and the Labour and Delivery Satisfaction Index.	Researchers claim that there was no significant difference in the levels of control and the satisfaction with labour and delivery in the 3 study groups, namely- 1. Intracutaneous sterile water injections (ISW), 2. TENS and 3. Standard back care including back massage, whirlpool bath and liberal mobilisation.	Results are contradictory as less women in the first group (ISW) indicated that they would like to use the same treatment again. However the researchers claim that this group is more effective than standard back care and TENS in labour (though not looking at satisfaction levels). TENS seems to have been applied to a higher risk group as 33% of this group had a LSCS and 0% of the ISW group had a LSCS. This seems biased, has limited generalizability and could be questioned ethically.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
19. Lee <i>et al</i> 1990	n = 125	Quantitative study Randomised double blind study using 3 groups- TENS, placebo and control. Chi-squared values were calculated.	Analgesic requirements, pain assessment, labour duration, obstetric outcome and comments from mother and midwife were analysed. No negative effects on the mothers and babies were reported. Neither was there any objective clinically significant differences demonstrated among the 3 groups. There was no effect on the fetal heart rate.	The participants had not attended antenatal classes. Pethidine was given as necessary, but epidurals were avoided. TENS may be helpful in the first stages of labour. Authors had difficulty in assessing pain as primips were at top of pain rating scale early in labour. Some patients reached the TENS machines maximum output early in the first stage of labour therefore they request that a higher intensity TENS machine is to be available.
20. Mc Munn <i>et al</i> 2009	n = 139	Quantitative study. Small survey	National survey of maternity units in England – Overwhelming support for the use of TENS. Highlighted that there is support for a trial of TENS versus standard care (RCT). The evidence base on which to inform women is currently poor. Lack of training on TENS application (7.9% midwives received training).	Challenges systematic review of TENS from 1997 which NICE guidelines were based on the study by Carroll (1997). Aimed to explore whether NICE guidelines have impacted on health professionals' use of TENS and found that they were not being adhered to. Robust evidence together with midwives' beliefs that TENS should be an available pain relieving option and confirms that there is a need for a randomised controlled trial. Does not consider qualitative research to investigate this evidence and midwives beliefs.
21. Miller Jones 1980	n = 51	Quantitative study Student's <i>t</i> – test used for analysis. Sample of 51 used TENS, 56 did not (used as a comparison).	TENS was simple to operate and reduced the overall pethidine requirement by TENS group. 82% obtained relief from back pain and 71% from abdominal pain in labour. 76% would use TENS again. TENS found to be non-invasive and no known complications, can be used in conjunction with other inhalational analgesia or pethidine and has no effect on fetal monitoring.	Patients were asked to turn off the TENS machine for one or two contractions and requested that it be turned back on immediately indicating that TENS gave considerable pain relief. Mobility and adopting various positions affected comfort and ability to cope. Reduces cost by lowering number of doses of pethidine administered and the side effects to the baby can be avoided.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
22. Nesheim 1981	n = 70	Quantitative study Placebo controlled but un-blinded study Active TENS treatment group (35) and placebo (35).	Women rated pain relief and TENS to be more positive in the TENS group than the placebo group. Observer bias recorded as midwives tended to pity patients using mock stimulation and more epidurals were offered. No clinically significant benefits of TENS in labour could be demonstrated in this study.	A wide variety of analgesics were used in both groups but Women's assessments of pain relief and of TENS value were more positive in the TENS group than the placebo. The number of regional blocks was doubled in the placebo group compared to the TENS group due to possible observer bias.
23. Padma <i>et al</i> 2000	n = 70	Quantitative study Controlled study using a test group.	Duration of labour has strong positive correlation with pain intensity and TENS by decreasing the pain, reduced labour duration by 120 minutes and 77 minutes in each group. Patients having short labours had difficulty accessing satisfactory analgesia with conventional methods. TENS therefore recommended as sole analgesic to those having short labours due to its rapid onset. TENS relieved backache in over 50% of study participants, (53% primigravida and 64% multigravida had good to excellent relief of back pain). TENS found to be simple to administer and have no side effects to mother or baby.	Recommended as a useful addition to the present methods of pain relief in labour. Women having short labours could benefit from TENS due to its rapid onset unlike conventional methods of pain relief. TENS used effectively for backache which can be a major part of labour for some women. Women had no prior knowledge about TENS. 50% of women showed a preference to use TENS as a form of analgesia in future.
24. Robson 1979	n = 35	Quantitative study	TENS is no alternative to effective epidural analgesia. Lack of detail of study makes it difficult to assess reliability and validity. 25.7% managed their labours with TENS alone. It was of great benefit to 20% of patients and of some benefit to 82%. Reduced doses of pethidine may be of benefit to mother and baby.	Mobility was limited due to fetal scalp clips being used however the researchers suggest that no restriction to movement took place. TENS machine was very large therefore mobility would have been difficult. Many of the women were already on labour ward being induced. Very small study of mainly high risk women. Over a quarter of women using TENS did not need or use any other form of pain relief. Distraction element mentioned.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
25. Stewart 1979	n = 67	Quantitative study Questionnaires used.	TENS increased personal contact between patient and attendant. TENS may introduce an element of suggestibility and distraction – factors known to affect an individuals' experience. TENS has a place in obstetric analgesia.	Contact between midwife and patient with TENS. Suggestibility and distraction noted and important factors and affects individuals experience. TENS seen to have a valid place as choice of pain relief.
26. Stewart 1986	n = 24	Quantitative study Pain rating scores used.	Women in the TENS group were mobile longer and no drowsiness was caused. TENS allowed greater freedom of movement and women were able to relax.	Neither group experienced complete pain relief throughout labour. TENS allowed women to relax and increased mobility.
27. Thomas <i>et al</i> 1988	n = 280	Quantitative study Randomised blind control study using visual analogue pain scale, a control group and test group.	No differences found in pain intensity in each group. No difference in pain experienced when machine switched off in the two groups. No difference in analgesics required. Some differences were found when those with severe back pain were excluded from the study. Conclude that TENS is ineffective as a routine method of pain relief in labour. It is likely to benefit only those with severe back pain and then only to a modest degree. A significant trend was shown- the test group experienced higher levels of pain relief and more in the test group indicated that they would like to use TENS again in future labours- the authors could not explain why there should be these differences.	Women were told that some of the machines would be inoperative. Women were excluded if they had any previous experience of TENS. There was purposely no prior education of patients about TENS in the antenatal parentcraft classes. The staff had no previous tuition in or experience of TENS. These were to reduce biases. There was a higher proportion of primips in the test group. Patients in advanced labour were excluded. Important point that the test (TENS) group experienced higher levels of pain relief and more in this group indicated that they would like to use TENS again in subsequent labours.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
28. Van der Ploeg <i>et al</i> 1996	n = 94	Prospective randomized placebo-controlled, double blind clinical trial using a patient-controlled analgesia (PCA) system to measure differences in outcome. Visual analogue scales used a few hours after delivery and statistical analysis used.	Outcome measures were pain relief, amount of administered analgesics, obstetrical and neonatal outcome and side effects. There were no significant differences between groups in the number of requests for pethidine/promethazine. The fetal outcome in both groups was the same. TENS was not more effective than a placebo apparatus in relieving pain during the first stage of labour. Although TENS and placebo were considered equally effective by patients and staff. No adverse side-effects occurred.	Pain relief was enhanced, if necessary by the use of an intravenous patient-controlled analgesia (PCA) system. The amount of pain relief used was an index of pain relief by TENS and placebo. This study does not consider mobility and freedom of movement and limits the woman's options as she is strapped to a cardiotocograph monitor and narcotic drugs were used, the woman may have been drowsy affecting her assessment of TENS. The study assesses the usefulness of TENS by the amount of narcotic analgesia used. The use of a patient controlled analgesia assumes that TENS will not be enough analgesia for labour. The way the effectiveness is assessed could be challenged.
29. Van der Spank <i>et al</i> 2000	n = 59	Quantitative trial to look at the effectiveness of TENS to provide pain relief in labour as well as the influence on requests for epidural analgesia. Experimental and Control groups used.	96% degree of satisfaction with TENS. Pain scores were significantly lower during TENS application. No statistically significant difference in the incidence of epidural analgesia was found between the experimental group and the control group. TENS had a good effect on low back pain. The results suggest that TENS is able to provide a statistically significant relief of pain during labour.	Study identified that in recent years there is a desire to avoid conventional and invasive types of analgesia. TENS was found to be non-invasive, safe, easy to apply and remove, it has no side effects, does not interfere with consciousness and there is no point in labour when it is too late to apply the TENS. The mother is able to remain alert, mobile and in control. The TENS had a distraction element. Recommends that all women are taught how to use TENS apparatus and all should experience TENS stimulation prior to labour.

REFERENCE	SAMPLE	METHODOLOGY	MAIN FINDINGS	COMMENTS
30. Wang <i>et al</i> 2007	n = 120	Quantitative study Studied 3 groups- TENS group, oxytocin group and control group. TENS applied to acupuncture points. Used VAS pain scales.	TENS group was superior to other two groups in pain relief, birth process acceleration and blood cortisol content. Conclude that TENS is a non-invasive, convenient and effective pain-relief method during labour without side-effects. First study that identifies that TENS can strengthen uterine contractions and therefore accelerate the labour process (this dual effect is not seen in any analgesic drugs).	Recent study with positive results regarding TENS. Recommending TENS for use as a non-invasive effective pain relief without side effects. Degree of pain was decreased markedly with TENS. TENS is simple, and can be applied throughout the entire process of labour. Low cost, safety and convenience widely accepted by patients. Could replace narcotic drugs and could be popularized in hospitals. Natural method to consider.

APPENDIX 4

Reflective Rationale

RATIONALE/REFLECTION	Cross Reference
<p>1. Research Question</p> <p>The impetus for undertaking the study arose from personal, professional and academic experiences.</p> <p>Professional experience over many years and the use of TENS posed the question about what it is that women find useful about TENS and how they see it in their whole labour experience. It was frustrating to see that the evidence in the literature contained only quantitative studies and failed to consider or ask the women what their experiences were. Studies that do not support the use of TENS acknowledged that women would use TENS again in future labours but did not investigate this any further. Quantitative research cannot provide in-depth descriptions of why this is.</p>	Section 1.7
<p>Traditionally, the care of women in childbirth was to find pain <i>relief</i> in labour (Moir, 1973), however now more attention has been given to the source of control of pain and when such control is lodged with the mother, she is able to experience the degree of pain which she finds acceptable (Mander, 1992). Pain 'relief' refers to a more medical model and insinuates that pain should be completely relieved and not controlled. The word 'control' therefore fits much better with the ethos of this study and has been used in the research question.</p>	Section 1.4
<p>The lack of qualitative research involving TENS combined with the use of TENS professionally in clinical practice contributed to the question of what it is that women find helpful about the TENS and by finding out their experiences positive and negative would help answer this question. Secondly, the TENS literature 'misses the point' and does not consider women's choice nor their experiences of using TENS in labour.</p>	Section 2.8
<p>I have an interest in TENS professionally and realise that this must not cloud my analysis of any negative findings in this research study. These are as important as positive findings and may be used to change practice. My beliefs are that I cannot suspend my feelings and experience of using TENS in practice completely, however these must be acknowledged. The research methodology used in this study is suited to this way of thinking and indeed acknowledges the importance of practitioners in the research field.</p>	Section 1.7
<p>I am an advocate of normal birth and supporting women to</p>	Section 1.5

<p>follow the normal pathways. I am interested in the use of TENS. I have many years of midwifery experience and have seen TENS used successfully and unsuccessfully at times. I support women in their choices for pain control in labour. TENS is widely used in our local area/trust by women who mainly use TENS well, why is this?</p>	
<p>I considered here how other aspects of care that I personally provided in the past, such as one-to-one support in labour, providing knowledge on TENS, promoting normal birth and having the woman's trust in clinical practice affect the use of TENS in labour?.</p>	
<p>Academically, the aim was to provide new research evidence that sits TENS more appropriately in the pain control arena, investigating its contribution to labour and the experience for the women who choose to use it.</p>	
<p>Questions that were considered when planning the research question for the study:-</p>	Section 1.7
<p>Why and how do women use TENS? How does TENS help with pain control in labour? Do different machines make a difference? How does TENS affect women's experiences of labour? What is it about TENS that women find helpful? Why would women use it again?</p>	
<p>The research question was therefore worded as -</p>	
<p>'What are women's experiences of using Transcutaneous electrical nerve stimulation (TENS) for pain control in labour?'</p>	
<p>2. Research Design</p>	
<p>In order to answer the research question a qualitative design was considered appropriate, the other approaches were considered. The study aimed to explore the lived experiences of the participants, therefore a phenomenological design was appropriate and which fitted well with investigating women's experiences.</p>	Section 3.1
<p>As more and more literature became available relating to Interpretative Phenomenological Analysis (IPA) and detailed the process of this type of study, it seemed to fit well with the type of study proposed. IPA uses phenomenology, hermeneutics and idiography, maintaining a focus on the individual as well as making claims for the larger group. This was appropriate and part of my research aims.</p>	Section 3.1.1
<p>In hermeneutics, the Hurselerian view was considered however was rejected due to the fact that I did not feel that I</p>	Section 3.1.2

<p>could suspend and completely bracket of my pre-conceptions. Heidegger's views however that the researcher is a vital component of the research and pre-conceptions cannot be suspended only acknowledged and are intertwined with the research study and phenomena and need to be acknowledged fitted much better and this view was taken.</p>	<p>Section 3.1.1</p>
<p>The researcher is a part of the interpretation of the experience and as Smith <i>et al</i> (2009) advocate one may only really get to know what the preconceptions are once the interpretation is underway. Smith <i>et al</i> (2009) acknowledges that the researcher is a vital component in the interpretation of the data and her knowledge and experience of the phenomena is intertwined with the participants.</p>	<p>Section 3.1</p>
<p>This research design fits with the midwifery philosophy of women centred care and investigating women's views and experiences may add to the body of research already available. The women's interpretation is vital in providing a true account of what happens in practice and supports this hermeneutic philosophy. IPA, by digging deeper has the possibilities of finding out in depth knowledge to inform practice for future midwifery care.</p>	<p>Section 3.2.1</p>
<p>3. Sampling Strategy</p> <p>The aim of the study was to use a sample of women that had used TENS and were willing to talk about their experiences. A purposive sample was therefore used in this study.</p>	<p>Section 3.2.1.2</p>
<p>In order to prevent bias and enhance credibility my personal 'caseload of women' was not used in the sample. Midwives' recruited the sample of women by approaching them and if they were interested and happy to be contacted they obtained their contact details.</p>	<p>Figure 3.1</p>
<p>Phenomenological studies within midwifery were searched in order to consider sample size. A sample size of 20 women was agreed by my supervisors.</p>	<p>Section 3.2.1.2</p>
<p>On reflection a smaller sized sample for an IPA study would have been easier to analyse and interpret. Fortunately Smith <i>et al</i> (2009) details the analysis and writing up of larger studies and this process was followed, not making claims for the larger group until all transcripts had been analysed.</p>	<p>Section 3.2.7.1</p>
<p>The study sample had been recruited much quicker than expected due to the number of women using TENS in the local area. Organisation was vital to ensure the smooth running of the interview process. The preparation was paramount providing the participants with the letter inviting them to join the study and the information sheets in order that they were fully informed before the study began. The</p>	

<p>consent forms were prepared in advance and were signed prior to the interview commencing.</p>	<p>Section 3.2.2</p>
<p>4. Interview Process</p> <p>In order to try and understand the participants' experiences, it was necessary to become familiar with their world. I was aware that as a professional I was a part of the setting that I was investigating and that I knew it intimately and that I did not want to miss important issues or considerations. In order to examine the world of the participants I began to question my assumptions to ensure that I was not taking this world for granted. I aimed to act like a stranger to the setting and hearing the experiences from the participants' perspectives was a whole new experience from seeing it from a midwives point of view. I had felt that I was immersing myself in the culture that I was studying. The culture not only consisted of the physical environment but also of particular ideologies, values, feelings and ways of thinking of the participants.</p>	<p>Table 3.3</p>
<p>The interview process was really enjoyable and being able to form a good rapport with the participants was important. I felt very honoured by how I was accepted into the participants own homes and how welcome they had made me. In my clinical practice, which was community based I had always considered that I was a guest in the woman's home and this ethos continued as part of this study. The participants were very keen to talk about their experiences and due to the fact that I was interested in their whole labour experience and where TENS sits within this gave them a chance to recount their labour experience which is often valuable in itself. The participants knew that I was a researcher in this capacity, however they knew from the letter and from other midwives that I was a midwife. This made a huge difference to the way the interviews progressed. It became evident that they trusted me and they were very keen to share their experiences. This mutual trust between myself and the participants was something that I valued and appreciated more and more as the study progressed and the analysis showed an openness of the participants to express feelings and their experiences. Reflection – This highlighted for me the importance of practitioners being involved in clinical research. I felt honoured to be doing this study listening to each unique experience from the participants perspective.</p>	<p>Appendix 5</p>
<p>It was vital here to see things as the participants do and to explore 'the insiders' view', the emic perspective (Harris 1976) in order to 'uncover' the meaning people give to their experiences and the way in which they interpret them. This qualitative research works on the premise that individuals are best placed to describe situations and feelings in their own words. I needed to seek and understand how participants</p>	<p>Section 3.3</p>

<p>make sense of their own behaviour. This required 'empathetic understanding', that is to examine the situations, events and actions from the participants' point of view, to be non-judgemental and not to impose my own perspective. The researcher's view is the etic perspective – 'the outsiders view' (Harris 1976) and the meanings of the participants' accounts are interpreted, identified and described. The participants' felt empowered as they did not merely respond to questions, they had a voice and guided the study. I felt that there was a relationship of trust between myself and the participants, this close relationship and my in-depth knowledge of labour and birth contributed to interviews.</p>	
<p>5. Data Analysis</p> <p>It had not occurred to me at first when interviewing that I was already consciously thinking about the data-the conversation analysis, however it quickly became apparent that this was part of the process. I wrote some important points down after the interview about how it proceeded and how I felt, not wanting to miss recording these feelings and thoughts.</p>	<p>Section 3.3</p>
<p>The analytical process as described by Smith <i>et al</i>, (1999).</p> <p>The two hermeneutic circles were an excellent way examining –the dynamic between researcher and participant and – the examination of parts and the whole of the text. The steps of analysis were followed and the two hermeneutic circles were incorporate in to the steps.</p>	<p>Figure 3.2</p> <p>Figure 3.3</p>
<p>During the analysis I became aware that I was visualising particular participants verbalising the text to me, this enabled me to reflect back to the interview conversation which enhanced meaning and identified the participant in my mind which somehow seemed to confirm meaning and conversations with more substance.</p>	<p>Table 3.5</p>
<p>Both of my supervisors were supportive in this part of the research. My main supervisor checked my process of analysis at various stages and supported my coding scheme that emerged from labelling and clustering the vast amount of phrases and meaning from the verbatim quotes. The final themes were checked by my second supervisor and verified that they exist within the data.</p> <p>6. Research Findings</p> <p>This is an exciting part of the study and resulted in a large chapter of findings being documented. It was very difficult not to include all of the quotes or phrases, and was a hard process of omission/decision trying to decide which phrases</p>	<p>Figure 4.1</p> <p>Section 4.3</p>

<p>were the best to articulate or demonstrate the findings. The findings were described using the super-ordinate theme, the main themes and the sub-themes to apply some sort of order. This was a difficult process particularly in labour and birth where many of the themes are intertwined with each other.</p> <p>The more writing took place the more I could acknowledge my feelings and preconceptions regarding this study and could appreciate what Smith <i>et al</i> (1999) had previously suggested.</p>	
<p>7. Discussion</p> <p>The discussion section is presented using the super-ordinate theme of control and its three sub-themes. The discussion draws on the preliminary literature review to compare the findings with previous studies on TENS. It also uses the current literature review to set the themes in the context of labour, pain relief and midwifery in order to support and discuss the findings. Women's control was central to this study discussion and is demonstrated in this section.</p>	<p>Figure 5.1 Chapter 2 Section 5.1 Section 5.2</p>
<p>8. Limitations, Recommendations and Conclusions</p> <p>Women's experiences of using TENS for pain control were included in this section in order to begin to draw the thesis to a close. The limitations of the study were acknowledged and documented.</p> <p>Recommendations for practice, education and research have been included. Conclusions have been drawn to set the research study in context in the light of new the in-depth evidence on the use of TENS for pain control in labour.</p>	<p>Section 6.2 Section 6.4 Section 6.5</p>

APPENDIX 5

Berg (1998) “ten commandments of interviewing”

1. Never begin an interview cold. Remember to spend several minutes chatting and making small talk with the subject. If you are in the subject's home, use what's there for this chatting. Look around the room and ask about such things as photographs, banners, books, and so forth. The idea here is to set the subject at ease and establish a warm and comfortable rapport.
2. Remember your purpose. You are conducting an interview in order to obtain information. Try to keep the subject on track, and if you are working with an interview schedule, always have a copy of it in front of you—even though you should have your questions memorized.
3. Present a natural front. Because your questions are memorized, you should be able to ask each one as if it had just popped into your head. Be relaxed, affirmative, and as natural as you can.
4. Demonstrate aware hearing. Be sure to offer the subjects appropriate nonverbal responses. If they describe something funny, smile. If they tell you something sad, look sad. If they say that something upset them, try to console them. Do not present yourself as uninterested or unaware.
5. Think about appearance. Be sure you have dressed appropriately for both the setting and the kind of subject you are working with. Generally, business attire is most appropriate. If you are interviewing children, a more casual appearance may be more effective. Remember to think about how you look to other people.
6. Interview in a comfortable place. Be sure that the location of the interview is somewhere the subject feels comfortable. If the subject is fearful about being overheard or being seen, your interview may be over before it starts.
7. Don't be satisfied with monosyllabic answers. Be aware when subjects begin giving yes-and-no answers. Answers like these will not offer much information during analysis. When this does occur, be sure to probe with questions such as, “can you tell me a little bit more about that?” or “what else happened?” Even a simple pause and an uncomfortable silence might yield additional information.
8. Be respectful. Be sure the subject that he or she is an integral part of your research and that any answer he or she offers is absolutely wonderful. Often subjects will say things like, “You don't really want to know how I feel about that.” Assure them that you really do!
9. Practice, practice, and practice some more. The only way to actually become proficient at interviewing is to interview. Although this book and other manuals can offer guidelines, it is up to you as a researcher to develop your own repertoire of actions. The best way to accomplish this task is to go out and do interviews.
10. Be cordial and appreciative. Remember to thank the subject when you finish, and answer any questions he or she might have about the research. Remember, you are always a research emissary. Other researchers may someday want to interview this subject or gain access to the setting you were in. If you mess things up through inappropriate actions, you may close the door for future researchers.

APPENDIX 6

Participant interview topic guide

The microphone and tape recorder will be placed appropriately prior to the interview being started and the women will be put at ease as much as possible.

In order to let the woman lead us through her journey of labour and her experiences of TENS, the following opening question will be used.

Can you tell me about your experience of labour?

Participants would then be invited to elaborate on the emergent issues arising from this question.

If the participants do not mention TENS spontaneously, this would be important to note. I would then have to use such prompts as-

Tell me about your experiences of TENS during your labour.

I may then need to use phrases such as-

Can you explain that further

What did you think about that

What do you mean by

How did you feel

* In order to minimise the potential for bias, the supervisor will review the transcripts from the interview and listen to a number of audio-tapes. This will ensure that the 'themes' identified are truly 'emergent' and not influenced by the line of questioning.

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APPENDIX 7

Annotation Guide

I	Interviewer (Researcher)
R	Respondent (Participant)
...	Normal conversational pause
()	Brackets used for names (e.g. partner, husband, mother, midwife)
Bold type	Indicated words being emphasised strongly
Blue type	Indicated specific behaviours (e.g. laughter)
Pink type	Indicated other points of note (interruptions, who was present, baby feeding)

APPENDIX 8

The ‘Audit Trail’

-Ethics Committee Application South Hampshire, Portsmouth and The Isle of Wight Ethics Committee.	<p>Attended the Ethics committee with main supervisor 20th October 2006. (Prior to this the research proposal had been submitted, passed and peer reviewed)</p> <p>Reply from ethics on 30th October 2006. 4 minor changes need to be made:-</p> <ul style="list-style-type: none"> -Take out leaflet -Take out poster -State women would be 16 years and over -Change wording on Patient Information Sheet to read women's experiences, not women's 'lived' experiences. <p>Re-submitted to committee chairman on 15th November 2006</p> <p>Full Ethical Approval on 1st December 2006.</p>
-Data Protection application	Full Data Protection granted from Research Site 8 th December.
-Research and Development approval	<p>16th January 2007, still awaiting final permission from Research site. Study still awaiting the medical directors' signature for the Research study to commence.</p> <p>Approached the Head of Family Services, personally as the Head of Midwifery supports the study. The Head of Family Services, contacted the Research and Development Officer to confirm that the Research is not going to encroach on 'staff time' (this had been her concern).</p> <p>26th January 2007, received final letter from Research site for study to begin.</p>
-Research Governance and Data Protection from University.	<p>Data protection and Research Governance had already been given by the university, subject to ethical approval.</p> <p>Ethical Approval forms sent to the Research Governance office at the University and the Research office, so that they were aware that the study was now able to start.</p>
-Methodology See recruitment process.	<p>First Interview (Practice Interview) 30th January 2007</p> <p>Hospital and Community Midwives informed of the Research, given information packs for the women and contact sheets for women's details.</p> <p>In reality, the midwife completed the contact form after the woman had given her permission for the researcher to contact her as she was interested in taking part in the study. The midwife passed it to the researcher, who then telephoned the women to arrange to post or drop off the 'information pack to her'. This was done and an appointment made for the interview. This was confirmed 24 hours before to make sure that the interview time and date were still convenient.</p>
-Consent	The consent form was explained and signed prior to the interview commencing (one copy was given to the participant and one was kept for the researchers file).
-Interview process	<p>The interviews took place over a five month period and overlapped with the transcribing process and returning to the participants for clarification of the transcript and preliminary themes.</p> <p>Prior to the interviews starting, the researcher entered into polite conversation in order to get to know the woman, and to attempt to put her at ease. The information pack was discussed and the woman was asked if she would like to know anything further about the research or if she had any queries.</p>
-Tape Recording	The tapes and machines were all checked prior to arriving at each house. The Tape recorders (2) were placed near to the Participant and Interviewer.

	They were quickly tested to make sure that they were working and switched on. Spare tapes and batteries were always kept by the researcher. The tape recorder was switched off if indicated by the participant or if the partner came into the room to ask the participant a question, if the baby was crying and would not settle, or if the participant seemed to need a break, also if the phone rang and the participant wanted to answer it. (In most instances it was left by the participant). Any interruptions were documented.
-Practicalities	The women all knew that the researcher was a midwife, which was detailed in the information pack. The researcher was welcomed into the women's homes very well. The researcher had refreshments if the woman offered. The partners were all politely asked during the telephone call from researcher to the participant if they would mind if the partners were not present. Some interviews were conducted with the baby in the room, feeding, sleeping, or being cuddled, this was accepted as being part of the interview process, many women also breast fed during the interview.
-Time	The interviews were all started with a question as per topic guide. The interviews were allowed to flow, some were longer than others, (25 minutes to 2 hours) each interview was allowed to come to its natural end.
-Closing the Interview	The Participants were thanked and the tape recorders switched off. The Participants were asked demographical questions before the interview started, if these had not been asked, it would be done afterwards, for example GP's name, surgery, age, parity, type of TENS machine used. Any clarifications were asked if aware about at the time, the participant was asked if they were happy about the interview, or if there was anything that they wanted to add. The Interviewer would remind the Participant that she would transcribe the interview and would document the 'Preliminary Themes' that come out of the interview and that she would bring it back to her for verification and clarification of any points. This would be arranged by telephone, and carried out within 2 to 4 weeks, and the appointment made to suit the participant. The researcher's approach to interviewing has been reviewed by the research supervisor by auditing a number of audio-tapes to ensure that she is using an objective and neutral approach.
-Transcribing the interviews	The interviews were transcribed verbatim, the participants were allocated a 'participant number', all names and places were removed to preserve anonymity. The transcribing process started whilst still recruiting participants. This process took ten months in total. This was a very frustrating and time consuming process. The interviews were transcribed personally, to begin to become immersed in the data. Having two tapes for each participant was useful, in order to be able to listen and clarify points. Table 4, Appendix 14 shows the abbreviations and format of the transcript annotations. I am also aware of how extremely privileged I was to be so easily welcomed into the women's homes and to be trusted to nurse and hold their babies. I have recorded thoughts and feelings during this process.
-Extraction of the 'preliminary themes'	Preliminary themes were extracted from the transcripts, in order to take back to the study participants. Appendix 15 shows an example of how this was done.
-Returning to the study participants	The participants were contacted after each interview had been transcribed and the preliminary themes extracted. A convenient time and date was arranged to return to the study participants. Changes, corrections and ambiguities were confirmed. Clarification of any points were made and recorded. Any areas of unclear tape were attempted to be made clearer. The participants enjoyed reading the transcripts and the opportunity to comment or change any of the transcripts. The respondents found the preliminary themes interesting and changes were made if they asked for this to be done. This enhanced the credibility of the study.
-Interim Assessment and viva	This was written and successfully passed (involving a viva) in November 2008.
-Data Analysis	Commenced in May 2008. Interpretative Phenomenological Analysis (Smith, 2004) was used, however IPA had been much more extensively written about and more detail was beginning to be documented as this research study progressed therefore the study became much more of an IPA study rather than being used for analysis alone as originally thought. It

	<p>maintained a hermeneutic phenomenological background whilst using IPA. Trustworthiness was enhanced by the researcher's second supervisor who analysed a number of transcripts and compared this with the researcher's analysis of the data and emergent themes. This supervisor also checked the way the themes were considered and clustered or grouped together after their meaning had been considered.</p> <p>The analysis highlighted that there was a large amount of data and there were over 4,000 phrases that were used to examine meaning and cluster into groups to form themes which then became sub-themes and main themes with an overarching super-ordinate theme that involved all of the other themes and that contained far more phrases than any of the other themes. The themes were considered carefully and checked that they actually did exist in the data, before moving on to the next theme. Chapter 3 details the analysis in detail with appendices to support the process.</p>
-The Findings	<p>The findings were detailed in chapter 4 and each theme and sub-theme was documented in order to allow the findings to flow. Verbatim quotes were used throughout to add substance to the themes and ensure their meaning. Tables were used in order to detail the phrases and their abundance across cases. Smith (2004) describes how to analyse and write up the findings of larger IPA studies and this was followed. It soon became evident that the sample size generated a vast amount of data and a smaller sample could have been used. An idiographic focus was maintained but claims for the larger group were able to be made for some of the findings .</p>
-Further Literature search	<p>A further literature Search of the 'themes' has been conducted following the analysis of the data. Looking at the 'Themes' in more depth aims to explain the phenomenon further, in order to set them in context within the research study. This has contributed to the discussion section of the study.</p>
-Discussion	<p>The discussion section in chapter 5 was written to set the findings in context with the preliminary literature review and therefore the previous research on TENS. The themes from the findings of the study were used to conduct a further literature search in order to support or refute the findings of the study. The discussion has situated the themes within the super-ordinate theme of control but within each sub-theme of control where they most appropriately belong. The themes do however overlap due to the nature of the research context-namely labour and birth being such a complex phenomenon. A summary was used to bring together the discussion.</p>
-Implications, limitations, final conclusions	<p>The phenomena of using TENS for pain control in labour were set in the context of midwifery recommendations and future research. Implications and limitations were identified and final study conclusion written.</p>
-Submission of the Final Thesis	<p>March 2011.</p>
-Viva	<p>This has been booked for June 2011.</p>

APPENDIX 9

Approval Letters

Approval letter from Ethics Committee

Approval letter from Research and Development site

University of Southampton sponsor agreement

University of Southampton professional indemnity insurance



DC/sta

01 December 2006

**ISLE OF WIGHT, PORTSMOUTH & SOUTH EAST HAMPSHIRE
RESEARCH ETHICS COMMITTEE**

1ST Floor, Regents Park Surgery
Park Street, Shirley
Southampton
Hampshire
SO16 4RJ

RESEARCHERS NAME
CONTACT ADDRESS

Tel: 023 8036 2863
Fax: 023 8036 4110

Email: GM.E.hio-au.SEHREC@nhs.net

Dear Ms Shawley

Full title of study: 'What are women's experiences of Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour?
REC reference number: 06/Q1701/130

Thank you for your letter of 13 November 2006, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Ethical review of research sites

The Committee has designated this study as exempt from site-specific assessment (SSA). There is no requirement for [other] Local Research Ethics Committees to be informed or for site-specific assessment to be carried out at each site.

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Application		27 September 2006
Investigator CV		01 October 2006
Protocol	4	13 November 2006
Covering Letter		01 October 2006
Summary/Synopsis	3	13 November 2006

An advisory committee to South Central Strategic Health Authority

Letter from Sponsor		09 June 2006
Peer Review		31 May 2006
Compensation Arrangements		08 June 2006
Interview Schedules/Topic Guides	2	24 May 2006
Advertisement : Appendix 2	2	24 May 2006
Letter of invitation to participant	3	10 March 2006
GP/Consultant Information Sheets	1	22 June 2006
Participant Information Sheet	4	13 November 2006
Participant Information Sheet: Information on the TENS Unit	1	10 January 2006
Participant Consent Form	2	10 March 2006
Response to Request for Further Information		
Letter of support from Winchester & Eastleigh Healthcare NHS Trust		23 February 2006
Appendix 11: Lone Interviewing Policy	1	23 May 2006
Appendix 8: TENS Study Contact Form	2	24 May 2006
Appendix 7: Return Form	2	24 May 2006
Appendix 9: Flow Chart to Show Recruitment Process	2	04 April 2006
Supervisor's CV: Andree le May		21 September 2006
Letter confirming compliance with DPA		07 June 2006
Letter from Funder		30 June 2006
Appendix 3: Advertisement to recruit practitioners	2	24 May 2006

Research governance approval

You should arrange for the R&D department at all relevant NHS care organisations to be notified that the research will be taking place, and provide a copy of the REC application, the protocol and this letter.

All researchers and research collaborators who will be participating in the research must obtain final research governance approval before commencing any research procedures. Where a substantive contract is not held with the care organisation, it may be necessary for an honorary contract to be issued before approval for the research can be given.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

06/Q1701/130

Please quote this number on all correspondence

With the Committee's best wishes for the success of this project

Yours sincerely

SIGNATURE REMOVED

Mr David Carpenter
Chair

Email: GM.E.hio-au.SEHREC@nhs.net

RESEARCH SITE/HEALTHCARE TRUST
NAME AND ADDRESS

Our Ref: ML/R&D040/weht128/meb

19th January 2007

RESEARCHERS NAME
CONTACT ADDRESS

Dear Ms Shawley

Re: What are women's experiences of transcutaneous electrical nerve stimulation (TENS) for pain control in labour
REC Ref: 06/Q1701/130

I am writing to confirm Trust Approval for the above project.

This approval is given on condition that the research project adhered to the protocol agreed by the Ethics Committee. Research Governance requires each project to be able to demonstrate that patients have formally consented. I would therefore request that you ensure appropriate records are kept of this process should the Trust be audited.

As a result of the recent external audit of Trust research governance I am now required to record the end date of the study in the governance file. From your completed ethics form I note this will be 1st November 2007. If an extension is granted could you please inform me in writing. Each year the local investigator will be asked to confirm continued participation in the research project.

Yours sincerely

SIGNATURE REMOVED

SIGNATURE REMOVED

NAME REMOVED
Director of Planning & Modernisation

NAME REMOVED
Medical Director



Tel: +44 (0)23 80598848/9

Ref: RSO 4224

Legal Services

University of Southampton
Highfield
Southampton
SO17 1BJ United Kingdom

Tel +44 (0)23 8059 4684
Fax +44 (0)23 8059 5781
Email legalservices@soton.ac.uk

REC (if available)

**RESEARCHERS NAME
CONTACT ADDRESS**

09 June 2006

Dear Lucinda

Project Title: What are womens' experiences of transcutaneous electrical nerve stimulation (TENS) for pain control in labour?

I am writing to confirm that the University of Southampton is prepared to act as sponsor for this study under the terms of the Department of Health Research Governance Framework for Health and Social Care (2001).

The University of Southampton fulfils the role of research sponsor in ensuring management, monitoring and reporting arrangements for research.

I understand that you will be acting as the Principal Investigator responsible for the daily management for this study, and that you will be providing regular reports on the progress of the study to the School on this basis.

I would like to take this opportunity to remind you of your responsibilities under the terms of the Research Governance Framework for researchers, principal investigators and research sponsors. These are included with this letter for your reference. In this regard if your project involves NHS patients or resources please send us a copy of your NHS REC and Trust approval letters when available.

Please do not hesitate to contact me should you require any additional information or support. May I also take this opportunity to wish you every success with your research.

Yours sincerely

SIGNATURE REMOVED

**Dr Martina Dorward
Research Governance Manager**

cc. File
Ruth McFadyen
Supervisor/s: (if applicable)



From: Ruth McFadyen

To: Lucinda Shawley

Ext: 22417

Dept: School of Nursing and Midwifery

E-mail: hrm@soton.ac.uk

Date: 8 June 2006

Reference: HRM/GFT/4224

Professional Indemnity Insurance

Project No: 4224

What are Women's Experiences of TENS for Pain Control in Labour?

Thank you for forwarding the completed questionnaire and attached papers.

Having taken note of the information provided, I can confirm that this project will be covered under the terms and conditions of the above policy, subject to written consent being obtained from the participating volunteers.

SIGNATURE REMOVED

Ruth McFadyen
Insurance Services Manager

APPENDIX 10

Letter inviting the women to take part in the study

**Trust Research site headed
paper used**

Name

Address of participant

Dear.....

I am a community midwife, conducting a 'Research Study' looking at women's experiences of using Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour. This study is part of a 'Clinical Doctorate Programme' at Southampton University.

If you chose to take part in the study, you would only need to be interviewed once, approximately 14-28 days after the birth of your baby, the interview will last for approximately 45 minutes to an hour. An information sheet is enclosed, which will explain more about the study. A consent form will need to be signed before the interview takes place and a copy is included for your information. The results of the study will be anonymous and confidentiality will be assured at all times. You have the right to refuse to take part in the study, however, if you do decide to take part, you may also withdraw from the study at any time.

Thank you for reading this letter.

Yours Sincerely,

L.A. Shawley.
S.R.N. R.M. D.P.S.M. B.S.c. (Hons)

Version 4. 10/03/06

APPENDIX 11

Participant information sheet

Part 1.

1. Study title

‘What are women’s experiences of Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour?’

A study of women’s experiences of using TENS for pain control in labour

2. Invitation paragraph

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following carefully and discuss it with others if you wish. **Part 1** tells you the purpose of this study and what will happen to you if you take part. **Part 2** gives you more detailed information about the conduct of the study. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

3. What is the purpose of the study?

The study aims to explore, describe and understand women’s lived experiences when using TENS as a form of pain control in labour. The purpose is to conduct research, to produce new evidence and therefore improve care for women. Even though the women are at the centre of our care, many studies on TENS have been carried out, however, they have not asked the women ‘what they think or feel’ (their experiences). The study is part of a ‘Doctorate in Clinical Practice’ course at Southampton University. The study will take place from 2006 – 2007.

4. Why have I been chosen?

Twenty women will be interviewed in this study. The women have been selected because they have used TENS for pain control in labour and fit the inclusion criteria pertaining to a ‘low risk’ delivery. The women will be approached, either a hospital midwife or a community midwife, and asked if they are interested in taking part in the study.

5. Do I have to take part in the study?

No. It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive.

6. What will happen to me if I take part?

The study will use interviews to collect data. Each woman will be interviewed once at approximately 14 - 28 days after the birth. A time will be arranged that will suit you. The interviews will take place in your own home if this is convenient, or in a room available in

a local health centre. The interviews will be tape recorded with the aid of a microphone and will last for approximately 45 minutes to one hour. All the information will be anonymous, the researcher will number the transcripts (typed version of what is said on the tape) from the interviews and no names will be used. The tapes will be kept secure in a locked filing cabinet at all times in the researchers home. The tapes will be returned to the participants, if they require them to or they will be destroyed after the research study has been written up.

7. What do I have to do?

If you are interested in taking part in this study, you may contact the researcher directly, the details will be at the end of this information sheet. Alternatively you may give your name and telephone number to a hospital or community midwife, who will pass it on to the researcher. By doing this you are giving permission for the researcher to contact you.

Questions 8 – 11 are not applicable.

12. What are the possible benefits of taking part?

The information obtained from this study may help to improve care for women in labour, in the future and understand more about the use of TENS for pain control in labour.

Questions 13 – 14 are not applicable.

15. Will my taking part in this study be kept confidential?

All of the information about your participation in this study will be kept strictly confidential. Any information about you, which leaves the hospital, will have your name and address removed so that you cannot be recognised from it. The details are included in part 2.

16. Contact for further information.

Lucinda Shawley (Midwife).

Address.

Telephone contact number.

Part 2

Question 17 is not applicable.

18. What will happen if I don't want to carry on with the study?

If you withdraw from the study, the data collected up to your withdrawal will need to be used.

19. What if there is a problem?

If you have any concerns about any aspect of this study, you should speak with the researcher who will do her best to answer your questions (contact details are in part1).

20. Will my taking part in this study be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you which leaves the hospital will have your name and address removed so that you cannot be recognised from it. The data collected in this study will only be seen by the researcher, however, it may be checked by regulatory authorities, in order to check that the study is being carried out properly.

21. What will happen to any data/information that I give?

All the information will be anonymous, the researcher will number the transcripts (typed version of what is said on the tape) from the interviews and no names will be used. The tapes will be kept secure in a locked filing cabinet at all times in the researchers home. The tapes will be returned to the participants, if they require them to or they will be destroyed after the research study has been written up.

Question 22 is not applicable.

23. What will happen to the results of the research study?

The results will be analysed and written up as 'Doctoral Research'. They will hopefully be published in a relevant journal when the research has been completed. You will not be identified in any report or publication.

24. Who is organising and funding the research?

The research is part of a 'Doctorate in Clinical Practice' course, run by the University of Southampton. The scholarship that was awarded to the researcher for this year, in order to do the research on TENS, was by 'The Wessex Deanery'. The research is planned by the researcher, however, is supported by two supervisors from the University.

25. Who has reviewed the study?

This study has been peer reviewed by the University of Southampton.
This study was given a favourable ethical opinion for conduct in the NHS by the Southampton REC.

You will receive a copy of the information sheet and a signed consent form to keep.

Thank you for taking part in this study.

APPENDIX 12

Ethics Committee Reference Number: 06/Q1701/130

Patient Identification Number:

**Trust Research site headed
paper used**

'What are women's experiences of Transcutaneous Electrical Nerve Stimulation (TENS) for pain control in labour?'

PARTICIPANT INTERVIEW CONSENT FORM

Name of Researcher: Lucinda Shawley

Please complete this form by placing your initials in the box next to each question. It is a statement that you are willing to take part in the interview and fully understand the study.

Please initial box

1. I confirm that I have read and understand the information sheet dated (version) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.
3. I understand that any data collected during the study, may be looked at by responsible individuals from Southampton University, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.
4. I agree to my GP being informed of my participation in the study.
5. I have agreed to the audio-tape recording of the interview in which I participate and for the interview material to be used for research purposes. I understand that any words I may say during the interview can be used, anonymously, in the presentation of the research.
6. I agree to take part in the above study.

Name of Patient

Date

Signature

Researcher

Date

Signature

When completed, 1 for patient; 1 for researcher site file:
version no.2. 10/03/2006

APPENDIX 13

Example of a Global Summary

GLOBAL SUMMARY INTERVIEW: PARTICIPANT 15

P.15 was a very motivated woman who had just given birth to her second baby at home. This was her second homebirth, she was very prepared for labour and her preference was to keep things as normal and as natural as possible, she had a positive attitude toward this. She was very well informed and had experience of using TENS professionally at work with patients using TENS successfully for chronic pain. She had previous personal experience of using TENS prior to this labour as she had used it both times.

P.15 had practiced with the TENS before labour, she knew where to apply the pads and had checked the batteries and that it was in working order and ready for labour. She had good knowledge about TENS and knew about stimulating endorphins by applying the TENS early, which she did herself. The midwife was supportive with the use of TENS in labour and adjusted the pads for her. She had several knowledge sources, she had read about TENS, heard about it at antenatal yoga classes and active birth classes. The midwife also talked about TENS in the antenatal classes with her first child. After the first labour she had decided to purchase her own TENS machine, however access to replacement pads proved difficult but were eventually found.

P.15's partner was involved in the labour and monitored and timed contractions and was supportive of the use of TENS in labour both times. P.15 requested not to have any drugs such as Pethidine and purposely did not have it in the house, she wanted a drug free labour at home and chose to use a combination of natural forms of pain relief of which TENS was included, along with yoga, breathing, mobilising, dancing and the birthing pool. TENS was found to be really helpful and the 'boost mode' was important. TENS was described as a 'distraction from the discomfort' and that it was 'masking the pain', which was highlighted when the TENS was removed to enter the birthing pool and contractions had felt much stronger after the TENS was removed. TENS was viewed as working two fold by taking her mind off the pain and also helping the actual pain as well. The physical sensation of TENS was described as 'tingly and quite pleasant when you had got used to it'.

TENS was used one night when P.15 was possibly in early labour, she was in pain and had lower back ache, she applied the TENS for pain relief and did not need to contact the hospital. By the morning the pain had subsided and the TENS was removed. TENS was therefore very versatile, it was removed to enter the pool, but re-applied on leaving the pool for a short time until P.15 felt the need to push and quickly removed the TENS and re-entered the pool. TENS was therefore used throughout labour and only removed at the very end to enter the pool and deliver the baby.

It was really important for P.15 to be mobile during labour she was active and was standing up, gravity and keeping upright made sense to her. She described feeling really safe and having a special birth area that was calm and relaxing. It was

important that P.15 took charge of what was going on and operating the TENS by ‘pressing the buttons and dialling up the TENS herself’ assisted in this. The TENS also made her feel completely in control particularly as she was able to do everything herself. The only time that her control was compromised was when the house was full of people, this was addressed and control was regained.

P.15 highlighted how TENS helped in three main ways, firstly it was a ‘distraction by taking your mind off the pain’, secondly it had ‘actual therapy benefit’ and thirdly it ‘helped to maintain the feeling of being in control’. P.15 had a lot of faith that TENS would work for her and voiced that she was absolutely convinced that it would work and never had any concerns about the TENS not working. P.15 had always had it in her mind to use TENS and in her words ‘TENS made sense’. Being in Control of herself and all that was happening around her affected her overall experience of labour, which she enjoyed and talked very positively about it. She has recommended TENS to other friends and would definitely use TENS again in subsequent labours.

Identification of Preliminary Themes

Knowledge and Application of TENS
Involvement of Partner
Combination of Natural Pain Relief
Distraction of the TENS
Physical Sensation
Versatility of TENS Application/Removal
Mobility During Labour
Being in Control
Wanting a Drug Free Labour
Faith in TENS
Midwife’s Support with TENS in Labour

APPENDIX 13A

Interpretative Phenomenological Analysis: Comparison of preliminary themes with final themes

COMPARISON OF PRELIMINARY THEMES WITH FINAL THEMES INTERVIEW: PARTICIPANT 15

Preliminary themes:

Being in Control (C)
Midwife's Support with TENS in Labour (1)
Involvement of Partner (1)
Mobility During Labour (2)
Wanting a Drug Free labour (2)
Combination of Natural Pain Relief (2)
Knowledge and Application of TENS (3)
Versatility of TENS Application/Removal (3)
Distraction of the TENS (4)
Physical Sensation (4)
Faith in TENS (5)

Final themes:

- C. 'Control' (Super-Ordinate theme)
- 1. 'Supporting the use of TENS'
- 2. 'Normalising labour and birth'
- 3. 'Needing to know'
- 4. 'The Distraction from pain'
- 5. 'Trusting in TENS'

A comparison of the preliminary themes and final themes was carried out for each study participant after completion of the analysis in order to identify whether the preliminary themes were all represented within the final themes of the study. The numbers in brackets along side the preliminary themes relate to where they were represented within the final themes and show that they were all included.

APPENDIX 14
Interpretative Phenomenological Analysis:
Initial Noting (excerpt)

Notes	Verbatim extract of text of interview transcript Participant 15
Very relaxed about labour Doing everything to bring labour on naturally Importance of being mobile expressed Tens machine on early to encourage the production of endorphins Practiced with Tens before labour and partner shown where to the put pads Wanted to test TENS and be prepared as didn't want to be rushed when in labour Well informed as used alternatives, eg Yoga, breathing, and movement with the TENS Gradually increasing the TENS	<p>Partner (named) got home from work about six o'clock and um I said I think something's happening and so he said well shall we just go for a walk, so you can bring it on because we knew that keeping active was quite likely to help and we had done two weeks of solid curries and pineapple and sex, (Respondent and Interviewer both laugh) to try and bring it on, because she was late. So we went for this walk and we just walked for about a mile and a half and suddenly started...the contractions were starting um and we just carried on walking, carried on walking and by the time we had finished the walk which was about I don't know about half an hour or something, um they were happening every sort of between two and four minutes and I thought 'ooh this is quite brisk', um so as soon as we got back I decided to put the TENS machine on because we had heard something about endorphins coming if you use them quite early on so um we had one practice before, because I am fairly stupid with things, so I just thought that if I hadn't worked out where to put them and shown Partner (named) where to put them we are just going to end up in a complete knot, if we are in a bit of a rush, so fortunately we had tested it before and we knew the batteries were working and things, um so stuck that on, had something to eat, and then um just started doing a bit of yoga, breathing and moving my arms and stuff like that, because I'd done some yoga classes, and that went on until about 10 o'clock, so that was about, I don't know about three hours or so, just using yoga and TENS and just gradually, gradually dialling the TENS up until we got to about I think it was half way up the dial watching a bit of television as well to distract ourselves, but just found it really, really helpful um just when you press the button and it goes 'sort of solid' um through the contraction.</p> <p>I:- The boost button?</p>

<p>herself-Importance of controlling it herself</p> <p>Using TENS as a distraction and watching TV-trying to do normal things whilst in labour</p> <p>TENS really helpful, particularly the 'boost button' which increases the frequency with a contraction</p> <p>Combination, TENS and yoga together distracting from the discomfort</p> <p>Lying down made the pain an awful lot worse</p> <p>Used <u>only</u> Tens up until half an hour before delivery</p> <p>Upright position better-standing up made a lot of difference as labour was progressing well</p> <p>Removing the Tens showed how helpful it had been – missed it!</p> <p>When the Tens machine off, noticed the pain was much worse</p>	<p>R:- Yes, that was just, you could really tell the difference, at the same time doing the yoga breathing stuff, the two things were just so distracting from the discomfort...um and then at 10 o'clock, I think, well we let Midwife (named) know at six or seven or what ever it was...that we had gone into labour and she said 'oh well just give us call when it starts getting a little bit more troublesome', um we got to about ten o'clock...and she came then um and I came and laid down so she could examine me and suddenly the pain got an awful lot worse, and I thought oh this standing up business has been making quite a lot of difference, so she said um I could get in the pool at that point because I was 5 cms, and I was quite chuffed, another four hours, no three hours from...I'd lost track four hours and 5, 6 cms, that's better than average so I was quite pleased about that and I had reached the point where I kind of wanted to try the pool because I had been getting all excited about this beautiful 'the pool' all this time (Respondent and Interviewer laugh) um so I just took the TENS off and by the time you have taken the TENS off you had got another contraction and that's when I realised how helpful it had been.</p> <p>I:- Right.</p> <p>R:- Because as soon as the TENS came off, I thought 'oh no, that actually really hurts' because before it had just been a little bit uncomfortable, not, not all that much fun, but not sort of painful, not making me cry out or anything like that, and as soon as the TENS came off that was really, that was what I expected labour to be like. Um so, I got in the pool as quickly as I could because I thought water is supposed to help the pain um but it went absolutely bonkers and within about 5 minutes I thought if this isn't moving on really quickly I am going to get out and put the TENS back on. (Interviewer agreeing) Because its just really hurting, and I don't know whether that's a good sign, or whether that's a sign that the TENS was working and the water isn't, I didn't really know um so that after about, I gave it about 15 minutes I think, and then I said to Midwife (named) it really feels like I need to push and she said it think it is probably too early, but we will have a look and she had a look and it had gone to 10cms.</p>
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APPENDIX 15
Interpretative Phenomenological Analysis:
Sentence Analysis (excerpt)

Sentence Analysis Interview Participant 15	Meaning/Interpretative Statement
<i>The following are sentences from the interview transcript to provide an example of data analysis.</i>	
I think something's happening and so he (partner) said well shall we just go for a walk, so you can bring it on because we knew that keeping active was quite likely to help	Belief and knowledge from previous personal experience of labour
The contractions were starting um and we just carried on walking, carried on walking and by the time we had finished the walk...they were happening every sort of between two and four minutes	Being mobile is important for labour to progress
As soon as we got back I decided to put the TENS machine on because we had heard something about endorphins coming if you use them quite early.	Knowledge about applying the TENS early can increase endorphins
But pretty much as soon as I got the first contraction I put the TENS on.	Importance and knowledge about getting the TENS on as early as possible

<p>We had one practice before, because I am fairly stupid with things, so I just thought that if I hadn't worked out where to put them and shown Partner (named) where to put them we are just going to end up in a complete knot.</p>	<p>Practicing with TENS before labour is important</p>
<p>Just started doing a bit of yoga, breathing and moving my arms and stuff like that.</p>	<p>Doing a combination of natural things</p>
<p>Just using yoga and TENS and just gradually, gradually dialling the TENS up.</p>	<p>Personal control of the TENS machine</p>
<p>But just found it really, really helpful um just when you press the button and it goes 'sort of solid' um through the contraction.</p>	<p>The sensation of the 'boost mode' is helpful</p>
<p>I thought oh this standing up business has been making quite a lot of difference.</p>	<p>TENS is allowing movement and upright position</p>

APPENDIX 16
Interpretative Phenomenological Analysis:
From Sentences to Main Themes (excerpt)

*Key=numbers shown relate to full Table of themes for reference (Appendix 18)

Sentence Analysis Interview: Participant 15	Meaning/Interpretive Statement	Clustering and Labelling of Themes	Sub Themes	Main Themes
<p>I think something's happening and so he said well shall we just go for a walk, so you can bring it on because we knew that keeping active was quite likely to help</p>	Knowledge about bringing on labour	Knowledge from previous personal experience (3.1.5)	Gaining knowledge (3.1)	'Needing to know' (3)
<p>The contractions were starting um and we just carried on walking, carried on walking and by the time we had finished the walk...they were happening every sort of between two and four minutes</p>	Being mobile is important for labour to progress	Tens is portable allowing mobility and freedom (2.1.1)	Being mobile (2.1)	'Normalising labour and birth' (2)
<p>As soon as we got back I decided to put the TENS machine on because we had heard something about endorphins coming if you use them quite early</p>	Knowledge about applying the TENS early can increase endorphins	Building up endorphins (2.2.3)	Natural and 'Drug free' (2.2)	'Normalising labour and birth' (2)
<p>We had one practice before, because I am fairly stupid with things, so I just thought that if I hadn't worked out where to put them and shown Partner (named) where to put them we are just going to end up in a complete knot</p>	Practicing with TENS before labour is important	Importance of knowledge about practicing with TENS before labour (3.1.2)	Gaining knowledge (3.1)	'Needing to know' (3)

<p>Just started doing a bit of yoga, breathing and moving my arms and stuff like that</p> <p>And just gradually, gradually dialling the TENS up</p> <p>But just found it really, really helpful um just when you press the button and it goes 'sort of solid' um through the contraction</p> <p>I thought oh this standing up business has been making quite a lot of difference</p> <p>By the time you have taken the TENS off you had got another contraction and that's when I realised how helpful it had been... as soon as the TENS came off that was really, that was what I expected labour to be like</p> <p>I am going to get out and put the TENS back on</p> <p>The two things were just so distracting from the discomfort</p>	<p>Doing a combination of natural things</p> <p>Personal control of the TENS machine</p> <p>The sensation of the boost mode is helpful</p> <p>TENS is allowing movement and being upright</p> <p>TENS had been masking the pain</p> <p>TENS can be reapplied if removed to early</p> <p>TENS was a distraction from the discomfort</p>	<p>Using a combination of natural things (2.2.5)</p> <p>Control of the TENS machine (C.3)</p> <p>The boost mode being an important sensation (4.3.3)</p> <p>TENS allows movement and upright postures (2.1.3)</p> <p>It was masking the pain (4.2.4)</p> <p>Versatility-can be removed and reapplied when needed (3.2.10)</p> <p>Diverting attention through operating the machine (4.2.2)</p>	<p>Natural and 'Drug free' (2.2)</p> <p>Control (C)</p> <p>Physical sensation (4.3)</p> <p>Being mobile (2.1)</p> <p>The 'distraction by TENS' (4.2)</p> <p>Practicalities of TENS (3.2)</p> <p>The 'Distraction by TENS' (4.2)</p>	<p>'Normalising labour and birth'(2)</p> <p>CONTROL</p> <p>'The Distraction from pain' (4)</p> <p>'Normalising labour and birth' (2)</p> <p>'The Distraction from pain' (4)</p> <p>'Needing to know' (3)</p> <p>'The Distraction from pain' (4)</p>
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APPENDIX 17
Interpretative Phenomenological Analysis:
Transcript with notes and Themes (excerpt)

*Key=numbers shown relate to full Table of themes for reference (Appendix 18)

Notes	Verbatim text of interview transcript Participant 15	Clustering and Labelling of Themes	Sub Themes	Main Themes
Very relaxed about labour	<p>I:- Ok Respondent (named) please could you talk to me about your experience of labour?</p>			
Doing everything to bring labour on naturally	<p>R:- So it started with Child (named) first. Yes, that was first, two years ago and just think how it started?, um I'd had a funny feeling all day that things were starting to happen, I just felt a little bit like um uneasy, I just felt like something wasn't quite right, and I had had a few Braxton hicks and I had have never had them before, so um Partner (named) got home from work about six o'clock and um I said I think something's happening and so he said well shall we just go for a walk, so you can bring it on because we knew that keeping active was quite likely to help and we had done two weeks of solid curries and pineapple and sex, (Respondent and Interviewer both laugh) to try and bring it on, because she was late. So we went for this walk and we just walked for about a mile and a half and suddenly started...the contractions were starting um and we just carried on walking, carried on walking and by the time we had finished the walk which was about I don't know about half an hour or something, um they were happening every sort of between two and four minutes and I thought 'ooh this is quite brisk', um so as soon as we got back I decided to put the TENS machine on because we</p>	Knowledge from previous personal experience (3.1.5)	Gaining knowledge (3.1)	'Needing to know' (3)
Importance of being mobile		TENS is portable allowing mobility and freedom (2.1.1)	Being mobile (2.1)	'Normalising labour and birth' (2)
Tens machine on early encourages production of		Building up	Natural and 'Drug	'Normalising labour

Notes	Verbatim text of interview transcript Participant 15	Clustering and Labelling of Themes	Sub Themes	Main Themes
<p>endorphins Practiced with Tens before labour and partner shown where to put pads</p> <p>Well informed – considering alternatives, eg Yoga, breathing, movement</p> <p>Tens really helpful</p>	<p>had heard something about endorphins coming if you use them quite early on so um we had one practice before, because I am fairly stupid with things, so I just thought that if I hadn't worked out where to put them and shown Partner (named) where to put them we are just going to end up in a complete knot, if we are in a bit of a rush, so fortunately we had tested it before and we knew the batteries were working and things, um so stuck that on, had something to eat, and then um just started doing a bit of yoga, breathing and moving my arms and stuff like that, because I'd done some yoga classes, and that went on until about 10 o'clock, so that was about, I don't know about three hours or so, just using yoga and TENS and just gradually, gradually dialling the TENS up until we got to about I think it was half way up the dial watching a bit of television as well to distract ourselves, but just found it really, really helpful um just when you press the button and it goes 'sort of solid' um through the contraction.</p>	<p>endorphins (2.2.3) Importance of knowledge about practicing with TENS before labour (3.1.2) Information specifically about TENS machines (3.1.2) (applying tens early) Practiced before use (3.2.5) Using a combination of natural things (2.2.5) Control of the TENS machine (C.3)</p>	<p>free' (2.2) Gaining knowledge (3.1) Gaining knowledge (3.1) Practicalities of TENS (3.2) Natural and 'Drug free' (2.2) Control (C3)</p>	<p>and birth' (2) 'Needing to know' (3) 'Needing to know' (3) 'Needing to know' (3) 'Needing to know' (3) 'Normalising labour and birth' (2) CONTROL</p>

Notes	Verbatim text of interview transcript Participant 15	Clustering and Labelling of Themes	Sub Themes	Main Themes
<p>Combination, Tens and yoga together distracting from the discomfort Lying down made the pain an awful lot worse Used <u>only</u> TENS up until half an hour before delivery Upright position better Removing the Tens showed how helpful it had been – missed it!</p>	<p>I:- The boost button?</p> <p>R:- Yes, that was just, you could really tell the difference, at the same time doing the yoga breathing stuff, the two things were just so distracting from the discomfort...um and then at 10 o'clock, I think, well we let Midwife (named) know at six or seven or what ever it was...that we had gone into labour and she said 'oh well just give us call when it starts getting a little bit more troublesome', um we got to about ten o'clock...and she came then um and I came and laid down so she could examine me and suddenly the pain got an awful lot worse, and I thought oh this standing up business has been making quite a lot of difference, so she said um I could get in the pool at that point because I was 5 cms, and I was quite chuffed, another four hours, no three hours from...I'd lost track four hours and 5, 6 cms, that's better than average so I was quite pleased about that and I had reached the point where I kind of wanted to try the pool because I had been getting all excited about this beautiful 'the pool' all this time (Respondent and Interviewer laugh) um so I just took the TENS off and by the time you have taken the TENS off you had got another contraction and that's when I realised how helpful it had been.</p>	<p>Able to do normal things (2.1.2) Distraction from the pain (4.2.1)</p> <p>The boost mode being an important sensation (4.3.3) Using a combination of natural things (2.2.5) (yoga and TENS) TENS allows movement and upright postures (2.1.3) Confidence in TENS (5.1.3) It was masking the pain (4.2.4)</p>	<p>Being mobile (2.1) The 'distraction by TENS' (4.2)</p> <p>Physical sensation (4.3)</p> <p>Natural and 'Drug free' (2.2)</p> <p>Being mobile (2.1)</p> <p>Trusting in TENS (5.1)</p> <p>The 'Distraction by TENS' (4.2)</p>	<p>'Normalising labour and birth'(2) 'The Distraction from pain' (4)</p> <p>'The Distraction from pain' (4)</p> <p>'Normalising labour and birth' (2)</p> <p>'Normalising labour and birth' (2)</p> <p>'Normalising labour and birth' (2)</p> <p>'Trusting in TENS' (5) 'The Distraction from pain' (4)</p>

APPENDIX 18 Table of Themes-Coding scheme showing how the main themes emerged from labelling and clustering of the study themes

‘CONTROL’				
1. ‘Supporting the use of TENS’	2. ‘Normalising labour and birth’	3. ‘Needing to know’	4. ‘The Distraction from pain’	5. ‘Trusting in TENS’
<p>1.1 The Midwives’ support antenatally</p> <p>1.1.1 Midwife loaned TENS to participant</p> <p>1.1.2 Midwife discussed TENS at antenatal classes</p> <p>1.1.3 Midwife affected the decision to hire TENS</p> <p>1.1.4 Lack of information on TENS from midwives</p> <p>1.2 The Midwives’ support in labour</p> <p>1.2.1 Midwife giving approval of TENS use</p> <p>1.2.2 Midwives’ support with practical application</p> <p>1.2.3 Psychological support from midwife</p> <p>1.2.4 Midwife was confident with TENS application and use</p> <p>1.2.5 Indifferent attitude of midwife</p> <p>1.2.6 Lack of practical support from midwife</p> <p>1.2.7 Midwives’ insinuation that TENS was not enough pain relief</p> <p>1.3 Partners support</p> <p>1.3.1 Partner controlled the TENS</p> <p>1.3.2 Partner applied the TENS</p> <p>1.3.3 Partner supportive of and interested in the use of TENS</p> <p>1.3.4 Partner attended antenatal classes to gain knowledge</p> <p>1.3.5 Interaction between participant and partner with TENS</p> <p>1.3.6 Partner felt involved</p> <p>1.3.7 Partner encouraged the early application of TENS</p>	<p>2.1 Being mobile</p> <p>2.1.1 TENS is portable allowing mobility and freedom</p> <p>2.1.2 Able to do normal thing</p> <p>2.1.3 Allows movement and upright posture</p> <p>2.1.4 Using TENS means not having to get on the bed</p> <p>2.1.5 TENS allows the use of different positions for labour and delivery</p> <p>2.1.6 Being mobile makes labour easier</p> <p>2.2 Natural and ‘Drug free’</p> <p>2.2.1 Requesting not to use invasive analgesia</p> <p>2.2.2 TENS is an alternative to using invasive analgesia</p> <p>2.2.3 Building up of endorphins</p> <p>2.2.4 TENS is a stand alone form of pain control</p> <p>2.2.5 Using a combination of ‘natural things’</p> <p>2.2.6 Wanting a ‘drug free’ labour</p> <p>2.2.7 TENS has no effects on the baby</p> <p>2.2.8 Wanting to be at home</p>	<p>3.1 Gaining knowledge</p> <p>3.1.1 Information specifically about TENS machines</p> <p>3.1.2 Importance of knowledge about practicing with TENS before labour</p> <p>3.1.3 Information from midwives and Antenatal classes</p> <p>3.1.4 Other sources of Information/knowledge</p> <p>3.1.5 Knowledge from previous personal experience</p> <p>3.2 Practicalities of TENS</p> <p>3.2.1 Ease of access of TENS machines</p> <p>3.2.2 Cost issue for participants</p> <p>3.2.3 Need assistance to apply TENS</p> <p>3.2.4 Good instructions for application</p> <p>3.2.5 Practiced before use</p> <p>3.2.6 Small, portable, simple machines required</p> <p>3.2.7 Wires can become detached and get in the way</p> <p>3.2.8 Takes time to take effect</p> <p>3.2.9 Can be used after the birth</p> <p>3.2.10 Versatility – can be removed and reapplied when needed</p>	<p>4.1 Security feeling</p> <p>4.1.1 The security of something to hold on to</p> <p>4.1.2 Feels safe to use</p> <p>4.2 The ‘Distraction by TENS’</p> <p>4.2.1 Distraction from the pain</p> <p>4.2.2 Diverting attention through operating the TENS machine</p> <p>4.2.3 It took my mind away from the pain</p> <p>4.2.4 It was masking the pain</p> <p>4.2.5 Giving me space</p> <p>4.3 Physical sensation</p> <p>4.3.1 Needs to feel comfortable</p> <p>4.3.2 Description of actual sensation/feeling</p> <p>4.3.3 ‘Boost’ mode being an important sensation</p> <p>4.3.4 Strength of the TENS (including levels articulated)</p>	<p>5.1 Believing in TENS</p> <p>5.1.1 Belief from previous experience</p> <p>5.1.2 Philosophy, ethos or idea of TENS</p> <p>5.1.3 Ideas of using TENS from the beginning</p> <p>5.2 Confidence in TENS</p> <p>5.2.1 Confident in the use of TENS</p> <p>5.2.2 Feeling confident and good about self</p> <p>5.2.3 Had faith that TENS would work</p>

APPENDIX 19

The stages of Interpretative Phenomenological Analysis IPA (Smith *et al*, 1999), including examples from the current study

Stages of Smith's IPA (1999)	Examples from the current study																
Semi-structured interviews Data from each interview transcribed verbatim- Questions must be transcribed as well as participants answers	20 semi-structured interviews All interviews personally transcribed verbatim including questions as well as answers																
Carrying out the analysis Stage 1 – Themes in the first place: <ul style="list-style-type: none"> • Read and re-read first transcript • Note down any observations about the data – can include themes, summaries, questions, use of words, metaphors etc • Very open stage of analysis – not to be confused with open coding of GT • Ideas are recorded down the left hand side of the transcript 	Stage 1 example <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Distracting from the discomfort</td> <td>I would be noticing the TENS rather than the contraction</td> </tr> <tr> <td>Upright position better</td> <td>I thought 'oh this standing up business has been making quite a lot of difference'</td> </tr> <tr> <td>Felt in control of herself</td> <td>An element of the feeling that you are in control</td> </tr> </table>	Distracting from the discomfort	I would be noticing the TENS rather than the contraction	Upright position better	I thought 'oh this standing up business has been making quite a lot of difference'	Felt in control of herself	An element of the feeling that you are in control										
Distracting from the discomfort	I would be noticing the TENS rather than the contraction																
Upright position better	I thought 'oh this standing up business has been making quite a lot of difference'																
Felt in control of herself	An element of the feeling that you are in control																
Carrying out the analysis Stage 2 – Generating theme titles: <ul style="list-style-type: none"> • Going back to the beginning of the transcript • Identify and label themes that characterise each section the right hand margin (i.e. initial themes are transformed into concise phrases that aim to capture the essence of what was found in the text) • You can use psychological terms here • Find expressions that are high level enough to allow theoretical connections but that are still grounded within the data 	Stage 2 example <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Distracting from the discomfort</td> <td>I would be noticing THE the TENS rather than DISTRACTION the contraction BY TENS</td> </tr> <tr> <td>Upright position better</td> <td>I thought 'oh this BEING standing up business MOBILE has been making quite a lot of difference'</td> </tr> <tr> <td>Felt in control of herself</td> <td>An element of the INTERNAL feeling that you are in CONTROL control OF SELF</td> </tr> </table>	Distracting from the discomfort	I would be noticing THE the TENS rather than DISTRACTION the contraction BY TENS	Upright position better	I thought 'oh this BEING standing up business MOBILE has been making quite a lot of difference'	Felt in control of herself	An element of the INTERNAL feeling that you are in CONTROL control OF SELF										
Distracting from the discomfort	I would be noticing THE the TENS rather than DISTRACTION the contraction BY TENS																
Upright position better	I thought 'oh this BEING standing up business MOBILE has been making quite a lot of difference'																
Felt in control of herself	An element of the INTERNAL feeling that you are in CONTROL control OF SELF																
Carrying out the analysis Stage 3 – Connecting the themes: <ul style="list-style-type: none"> • List the themes from stage 2 and consider relationships between them • Clustering themes is an attempt to clarify into overall themes • Some themes may emerge as super-ordinate concepts (a magnet pulling the themes in) • Go back to the transcript and check that the themes do actually exist within the data • Produce a table of themes ordered coherently • Give clusters of themes a name and also represent any super-ordinate themes 	Stage 3 example <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">Subordinate theme</td> <td style="width: 70%; text-align: center;">Sub themes</td> </tr> <tr> <td>-‘CONTROL’</td> <td>-Internal control of ‘self’ -External control of others -Control of the TENS machine</td> </tr> <tr> <td style="text-align: center;">Main themes</td> <td style="text-align: center;">Sub themes</td> </tr> <tr> <td>-Supporting the use of TENS</td> <td>-The Midwives’ support antenatally -The Midwives’ support in labour -Partners support</td> </tr> <tr> <td>-Normalising labour and birth</td> <td>-Being mobile -Natural and ‘Drug free’</td> </tr> <tr> <td>-Needing to know’</td> <td>-Gaining knowledge -Practicalities of TENS</td> </tr> <tr> <td>-The Distraction from pain</td> <td>-Security feeling -The ‘Distraction by TENS</td> </tr> <tr> <td>-Trusting in TENS’</td> <td>-Physical sensation -Believing in TENS -Confidence in TENS</td> </tr> </table> <p style="text-align: center;">*For clustering of themes see Appendix 18</p>	Subordinate theme	Sub themes	-‘CONTROL’	-Internal control of ‘self’ -External control of others -Control of the TENS machine	Main themes	Sub themes	-Supporting the use of TENS	-The Midwives’ support antenatally -The Midwives’ support in labour -Partners support	-Normalising labour and birth	-Being mobile -Natural and ‘Drug free’	-Needing to know’	-Gaining knowledge -Practicalities of TENS	-The Distraction from pain	-Security feeling -The ‘Distraction by TENS	-Trusting in TENS’	-Physical sensation -Believing in TENS -Confidence in TENS
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-Trusting in TENS’	-Physical sensation -Believing in TENS -Confidence in TENS																
Description of themes and discussion of findings	Description of themes, findings and discussion																

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