1-1-1992

The relationship between episiotomy and perineal lacerations and perineal pain following childbirth

Christine J. White
Edith Cowan University

Recommended Citation

1992

The relationship between episiotomy and perineal lacerations and perineal pain following childbirth

Christine J. White
Edith Cowan University

Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.

- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author's moral rights contained in Part IX of the Copyright Act 1968 (Cth).

- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

THE RELATIONSHIP BETWEEN EPISIOTOMY AND PERINEAL LACERATIONS AND PERINEAL PAIN FOLLOWING CHILDBIRTH

BY

Christine Joy White B. Hlth Sc (Nursing) - Hons

A Thesis Submitted in Partial Fulfilment of the
Requirements for the Award of

Master of Nursing

at the School of Nursing, Edith Cowan University

Date of submission: 9.11.92

Abstract

One of the major contributions that midwives can make to the comfort and well-being of child-bearing women is the skilful care of the perineum during delivery. This study investigated the short and long-term effects of perineal trauma in order to provide a basis for decision-making in the midwives' perineal management at delivery and client self-care. Specifically, the study examined the relationship between the extent of perineal trauma and the intensity and duration of perineal pain during the first three months following a vaginal birth; and compared discomfort among mothers whose perineal trauma was the result of an episiotomy, perineal, vaginal or labial lacerations, or who delivered with an intact perineum. All women, who required perineal repair during a six-month period at a large metropolitan hospital, were surveyed by a series of three structured questionnaires, at three days, six weeks and three months postpartum. One hundred and one women, who delivered over an intact perineum, were selected to serve as a control group. Analysis of variance with Tukey Studentized Range (HSD) test using the General Linear

Models Program, Wilcoxon matched-pairs signed-ranks test, Kruskal-Wallis chi-square approximation and chi-square analysis were applied to the data, using the SAS program. Results of the analyses demonstrated statistically significant differences between the perineal outcome subgroups. For the women who underwent an episiotomy during delivery, there was a general trend for increased pain and associated healing problems with the perineum. Further, factors found to be significantly associated with increased postpartum perineal pain were epidural analgesia and prior dyspareunia. Infant birthweight was significantly associated with perineal outcome. The results of this study will form the basis for: improving midwives' knowledge and understanding of perineal trauma, giving direction to the evaluation and revision of decision-making and clinical practice skills during delivery, integrating midwives' theory base and practice base, and anticipating associated problems with perineal trauma. The knowledge gained will provide a basis for guiding clients towards the ability to self-manage pain relief, overcome associated problems of perineal trauma, and their adaptation to the motherhood role.

Declaration

"I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text".

Acknowledgements

I wish to sincerely thank the following special people for their assistance with this study.

My appreciation goes to my supervisor, Associate Professor Anne McMurray. Anne's constant guidance, support and encouragement inspired me and made it possible for me to achieve far more than I expected.

Dr Sharon Evans, Biostatistician at King Edward Memorial Hospital, whose patience never ceased to amaze me. Sharon's cheerful, unfailing assistance and advice saved my sanity whilst I was analysing the data.

Amanda Blackmore, Research Consultant at Edith Cowan University, for her cheerful assistance and advice with data analysis.

The Director of Nursing, Miss Martin, and my many colleagues at K.E.M.H. who are, unfortunately, too numerous to name. However, without their invaluable assistance and interest this project would not have become a reality.

The women who were so interested and willing to participate in this study. Without their assistance this study would not have been possible.

Finally, I would like to express my sincere gratitude to my family. Very special thanks to Phil for his support and for trying to accept that I had another "life" after work, to my mother for her constant faith and encouragement and to my sisters and their families for their support and understanding.

Table of Contents

List of Tables

List of Figures

.

**The Relationship Between Episiotomy and Perineal
Lacerations and Perineal Pain Following Childbirth**

The repair of an episiotomy and of perineal lacerations
following childbirth is the most common surgical procedure
performed on women (Cunningham, MacDonald, & Gant, 1989).
Yet, few studies have been conducted where comparisons have
been drawn between the mothers' immediate, short and long-
term experiences of pain arising from either episiotomy or
perineal lacerations.

Perineal trauma is an issue of concern to women giving
birth because of the risk of associated problems such as
increased blood loss from the trauma, postpartum pain,
infection, dyspareunia, and unsatisfactory anatomic results
after the trauma has healed.   It is also of concern to
midwives in that it directly affects the midwives' management
of delivery and postnatal care of the women.   Further, the
extent of perineal trauma may be related to the newborn's
birthweight, and factors such as the type of anaesthesia used
for suturing, the type of suturing material and technique for

repair; all of which may influence the intensity and duration of perineal pain.

This study attempted to investigate the effects of perineal trauma in order to provide a basis for education and for decision-making in the midwives' clinical management of delivery. Specifically, the study examined the relationship between the extent of perineal trauma and the severity and duration of perineal pain during the first three months following childbirth.

Background and Significance of the Problem

Episiotomy, as first described by Sir Fielding Ould in 1742, is the surgical incision, and repair, of a woman's perineum to enlarge the vaginal orifice in order to facilitate the delivery of a baby (Laufe & Lesley, 1972). This procedure has only received acceptance by obstetricians during this century, but it has now been so completely incorporated into modern obstetrics that an episiotomy has become a "normal" part of childbirth for most women. With the one exception of cutting and tying the umbilical cord,

episiotomy has been described as the most common operation in obstetrics (Cunningham et al., 1989) and is often performed without the woman's knowledge or consent, and often without good reason (Inch, 1982; Kitzinger, 1981; Rockner & Olund, 1991).

Information about episiotomy rates is scanty, although widely varying rates ranging from 14% to 96%, have been reported from a survey of British maternity units (Sleep et al., 1984). In the United States of America, episiotomy is performed more as a routine procedure, with rates of 62% to 80% being reported (Kozak, 1989; Thorp & Bowes, 1989). Data obtained by the author from the birth register at a large metropolitan hospital in Perth, Western Australia, revealed an overall episiotomy rate of 36.6% during 1990. This rate declined slightly to 34.5% during 1991.

The incidence and effective prevention of episiotomy has become increasingly controversial. It is one of several modern and widely accepted obstetric practices that lately has been subjected to considerable debate by consumers and professionals (Cater, 1984; Kitzinger & Walters, 1981;

Reynolds & Yudkin, 1987). Although few studies have been
conducted on women's subjective reactions of pain and
discomfort after episiotomy, the practice of doing the
operation routinely is now being questioned in the United
Kingdom and Sweden (Kitzinger, 1981; Larsson, Platz-
Christensen, Bergman, & Wallsterson, 1992).

There is general agreement that an episiotomy is
indicated in instrumental deliveries (forcep deliveries and
vacuum extractions) breech deliveries, and to facilitate a
quick delivery of a preterm or distressed infant (Fraser,
1983; Thranov, Kringelbach, Melchior, Olsen, & Damsgaard,
1990). However, it is apparent from the episiotomy rates
reported in the literature that many women having an
uncomplicated delivery also experience an episiotomy. This
may be because most obstetric and midwifery texts
consistently advocate performing episiotomies to preserve the
integrity of the pelvic floor and prevent uncontrolled tears
which would take longer to heal than a "clean cut" (Bennett
& Brown, 1989; Clayton, Lewis, & Pinker, 1985; Oxorn, 1986;
Towler & Butler-Manuel, 1980). As a result, many midwives
have lost the art of managing the perineum with p ience,

anticipation and confidence but without surgical intervention.

Even when the use of episiotomy is restricted, however, trauma to the perineum and vagina is commonly sustained during vaginal delivery (Sleep et al., 1984). In their study, these authors found that when the midwives were asked to avoid an episiotomy and to restrict its use to fetal indications exclusively (bradycardia, tachycardia, or meconium stained liquor), only 10% of the women received an episiotomy. Nevertheless, despite the episiotomy restriction, 69% of the same group of women required suturing for perineal trauma. This result was congruent with the data the author had taken from the Perth Hospital's 1990 and 1991 birth registers, which showed that, in addition to the 36.6% and 34.5%, respectively, of women requiring episiotomy, a further 25.5% and 31.5% of women sustained first or second degree perineal lacerations when an episiotomy was not performed, making the total percentage of women requiring perineal repair 62.1% for 1990 and 66% for 1991.

At the Perth metropolitan hospital the most senior qualified person present at the majority (83%) of non-instrumental vaginal deliveries is the midwife (K.E.M.H. Birth Register, 1990). In most cases, the women are entirely managed during an uncomplicated labour and delivery by their attending midwife, unless medical or obstetric complications arise which require referral to medical staff. The decision to perform an episiotomy is made by the attending midwife at the time of delivery.

The successful repair of the episiotomy or perineal laceration constitutes a major factor in a woman's postpartum comfort and future well-being. However, owing to the frequent occurrence of episiotomy and perineal trauma, the surgical repair is often performed perfunctorily, inadequately and improperly (Sheriff, 1984) so that it is "one of the least considered and most painful of all operations performed on the human female. Far too many women leave hospital with the memory of perineal pain, which they aver was far worse than the pain of parturition" (Llewellyn-Jones, 1971, p.310).

One major part of the midwives' caregiving role during the early postnatal period is to advise and assist women with the problem of alleviating post perineal trauma pain. Although the attending midwives are able to assess the extent of the immediate pain most of these women experience, they have no way of knowing the long-term effects of the "minor' perineal surgery. Willmott (1980) suggests that the longer term effects have not been rated as particularly serious. The lack of midwives' awareness of the long-term effect of pain possibly results from several factors. First, midwives generally do not see the women they care for again. After their discharge from hospital the women are referred to their own medical practitioner for their routine six week postnatal check-up. Second, women are either naturally sensitive and too embarrassed to talk about perineal and vaginal pain, or are, as Kitzinger (1981) reports, accepting of the perineal pain and healing complications as an inevitable sequel to childbirth. Third, women's subjective experiences of the short and long-term effects of perineal trauma have seldom been studied and reported.

Perineal management and care falls unequivocally in the midwives' sphere of practice and responsibility (Sleep, 1991). It is therefore important that management of the perineum during childbirth be based on sound research evidence.

Purpose of the Study

The purpose of this study was to examine the relationship between the extent of perineal trauma and the intensity, duration and nature of pain or discomfort for the first three months following a vaginal delivery; and to compare discomfort among mothers whose perineal trauma was the result of an episiotomy, perineal, vaginal or labial lacerations, or delivering with an intact perineum.

The study surveyed women three days, six weeks and three months following their delivery.

Definition of Terms

Apgar Score: The evaluation of an infant's physical condition, performed one minute, and again, five minutes after birth, based on a rating of five factors that reflect the infant's ability to adjust to extra-uterine life (Mosby's, 1986).

Cystocele: A hernia of the bladder into the vagina as a result of damage to the pelvic floor during childbirth (Adams, 1983).

Episiotomy: An intentional surgical incision of a woman's perineum to facilitate the delivery of a baby.   The episiotomy may be mediolateral or median (midline).
Mediolateral - the incision is started at the midline of the fourchette and is directed in a posterolateral direction, usually to the womans right.
Median or midline - the incision is started at the fourchette and is extended posteriorly through the perineal body or perineum (Adams, 1983).
An illustrative diagram of episiotomy is given in Figure 1.

<u>Fourchette</u>: A fold of skin at the posterior angle of the vagina connecting the posterior ends of the labia minora (Adams, 1983)(see Figure 1).

<u>Labia Minora</u>: Two folds of skin extending from the clitoris backwards on both sides of the vaginal orifice (Adams, 1983)(see Figure 1).

<u>Midwife</u>: A registered nurse who has successfully completed the prescribed course of studies in midwifery and has acquired the requisite qualifications to be registered to practice midwifery (Adams, 1983).

<u>Multipara</u>: A woman who has borne more than one child (Adams, 1983).

<u>Nullipara</u>: A woman who has never given birth to a child (Adams, 1983).

<u>Perineal Tears</u>: Three degrees of perineal tears are currently used in Australia:

1.   First degree tear - a tear of the perineal skin or

fourchette only, but not the underlying muscles of the perineal body.

2.   Second degree tear - a tear of the perineal skin and muscle of the perineal body which may be slight or severe, but which does not include the anal sphincter.

3.   Third degree tear - partial third degree tear, where the tear extends through the whole of the perineal body and anal sphincter.

Complete third degree tear (or fourth degree tear), where the tear extends through the perineal body and anal sphincter into the rectal mucosa (Adams, 1983).

Perineum: The perineal body, the central point of the pelvic floor situated between the lower third of the vagina and the rectum, into which the levator ani, superficial perineal muscles (bulbocavernosus and transverse perinei) and deep pelvic floor muscles (pubococcygeus) are inserted (Adams, 1983) (see Figure 2).

Postnatal / Postpartum: After giving birth to a baby (Adams, 1983).

Primipara: A woman who has given birth to her first child (Adams, 1983).

Rectocele: A hernia of the rectum into the vagina as a result of overstretching of the vaginal wall during childbirth (Adams, 1983).

Stress Urinary Incontinence: The inability to control urination. Precipitated by coughing, straining or heavy lifting (Mosby's, 1986).

Uterine Prolapse: The protrusion of the uterus into the lower part of the vagina, as a result of the weakening of its supports (Adams, 1983).

Vaginal Delivery: The birth of a baby through the vagina. The baby may present head first (cephalic presentation) or by the buttocks, feet or knees (breech presentation). The delivery may be spontaneous (normal), or assisted (instrumental) with the use of obstetric forceps or a vacuum extractor (ventouse) (Adams, 1983).

site for labial tears

fourchette
medial episiotomy

mediolateral episiotomy
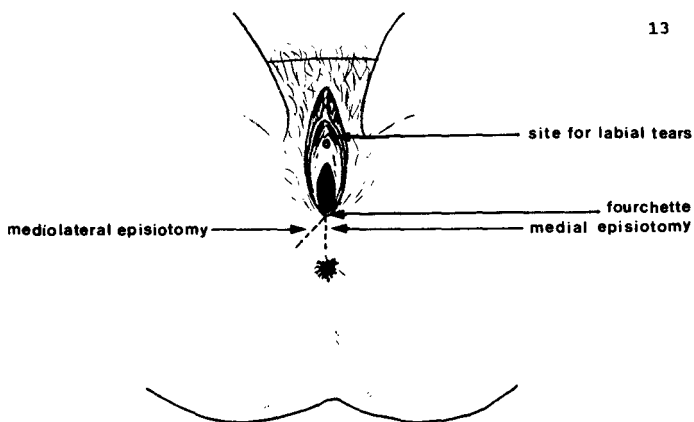
Figure 1. Episiotomy site - medial (midline) and
mediolateral.
Source: Drawn by the author.

mons pubis

clitoris

labia minora — urethral orifice

vaginal orifice — bulbocavernosus m.

transverse profundus m. — ischiocavernosus m.

transverse perenei m.

anus — pubococcygeus m.

external anal sphincter — iliococcygeus m.

gluteus maximus m.

coccyx
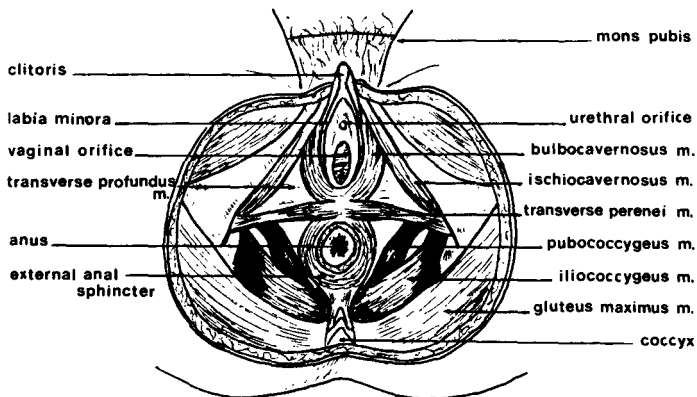
Figure 2. Female perineum.
Source: Drawn by the author.

Hypotheses

This study tested the following research hypotheses:

1.   The incidence, intensity and duration of study participants' self reported pain will be significantly less following vaginal delivery with an intact perineum than following vaginal delivery with a perineal tear or episiotomy.

2.   The incidence, intensity and duration of participants' self reported pain will be significantly less following vaginal delivery with a vaginal or first degree perineal tear than following vaginal delivery with an episiotomy or second degree perineal tear.

3.   Participants undergoing an assisted vaginal delivery with episiotomy will experience a significantly greater intensity and duration of perineal pain than participants undergoing a spontaneous vaginal delivery with tearing or episiotomy.

Objectives:

The main objectives of this investigation were as follows:

1.   To compare the perineal outcome, in terms of pain and discomfort, of women delivered vaginally with episiotomy or perineal tears with those women delivering with an intact perineum.

2.   To compare the perineal outcome, in terms of pain and discomfort, of women delivered vaginally with episiotomy with those women sustaining vaginal and perineal tears.

3.   To compare the perineal outcome, in terms of pain and discomfort, of women undergoing a spontaneous vaginal delivery with tearing or an episiotomy with those women undergoing an assisted vaginal delivery with episiotomy.

4.   To identify the short and long-term (three months) physiological and painful effects of episiotomy and/or perineal tears sustained by women during vaginal delivery.

5. To identify the relationship between the different suturing methods used and the intensity and duration of perineal pain.

6. To identify the relationship between the different suturing materials used and the intensity and duration of perineal pain.

7. To identify the relationship between the type of anaesthesia used for perineal suturing and the intensity of short-term (three day) perineal pain.

8. To identify the relationship between the weight of the newborn at birth and the degree of perineal trauma.

9. To determine if a history of dyspareunia has any relationship to the degree of perineal trauma and the intensity and duration of dyspareunia following childbirth.

The Structure of the Thesis

This first chapter discussed the background, significance and purpose of the study. Key terms used throughout the report were defined and the research hypotheses and objectives presented.

Chapter 2 presents the historical background to perineal management and examines, in particular, the literature related to the benefits and risks of episiotomy.

Chapter 3 outlines the conceptual framework, derived from Orem's general theory of nursing, which guided the study. The chapter concludes by identifying and operationally defining the major variables used in the study.

Chapter 4 identifies the research design used, the setting and sample selection, instruments used, reliability and validity, data collection procedures and ethical considerations. The chapter concludes with a description of the data analysis and methodological limitations.

Chapter 5 presents the study results under the headings of sample characteristics and specific findings for each hypothesis and objective.

Chapter 6 discusses the major findings and conclusions from the study and concludes with the implications for midwifery practice and recommendations for further research into perineal management.

Chapter 2

Review of the Literature

The professional literature on episiotomy reveals numerous articles comparing types of episiotomy incisions, suturing techniques and materials, and methods of immediate pain relief. Fewer studies, however, have been carried out on the effects of episiotomy or perineal laceration repair on the mothers or their experiences of the perineal trauma.

This review is divided into three areas: historical background of perineal management, benefits of episiotomy and risks of episiotomy.

Historical Background of Perineal Management

Concern for the perineum during childbirth extends to the ancient times of Hippocrates and Aristotle (Cogan & Edmunds, 1977). From these early times until the nineteenth century midwives were instructed in numerous techniques of preventing perineal trauma at the time of vaginal delivery.

In 1836, a German obstetrician, von Ritgen, advised physicians to strive for complete protection for the perineum. By using up to fourteen superficial, circumferential vaginal incisions (termed 'scarification') von Ritgen remarkably failed to provide protection against significant perineal tears in only six out of 3,464 deliveries. In the concluding paragraph of his article written in 1855 (translated by Wynn, 1965), von Ritgen warned against dismissing his method of protecting the perineum as "much ado about a perineal tear!" (p. 433).

During the late nineteenth century episiotomy became the subject of as much controversy as earlier perineal care techniques. An increasing number of physicians advocated episiotomy for certain complicated deliveries, but resistance to the procedure persisted. Episiotomy had been first used and described by Sir Fielding Ould in 1742 as a means of facilitating extremely difficult deliveries. However, despite Ould's recommendations, physicians at the time rarely performed perineal incision (Laufe & Lesley, 1972). This was, in part, because anaesthesia was not available and infection rates were so high that surgery was considered to

be a very serious undertaking (Banta & Thacker, 1982). During this time perineal lacerations were regarded as a normal occurrence and it was considered wholly inappropriate to repair them (Fox, 1979). The term "episiotomy" was attributed to Carl Braun in 1857, who condemned it as an inadvisable and unnecessary procedure (Thacker & Banta, 1983).

The modern popularization of episiotomy began early this century. In 1918, Pomeroy suggested routine episiotomy and repair in all primiparas to reduce prolonged pressure on the fetal head. Acceptance of the procedure increased further when, in 1920, De Lee advocated episiotomy and forceps to increase the comfort of women in labour, reduce blood loss, preserve the condition of the pelvic floor, and protect babies from injury associated with the second stage of labour (Cogan & Edmunds, 1977)

Despite the lack of substantiating evidence, Pomeroy and De Lee's recommendations were increasingly adopted. The practice of episiotomy, as a routine procedure, coincided with several trends: the move of deliveries from the home to

the hospital, diminishing family sizes, an increase in caesarean deliveries, and a change in attendants from midwives to physicians (Thorp & Bowes, 1989).

In 1938, an American obstetrician, Diethelm, reflected the opinion of the obstetric community in asserting that the "indications (for episiotomy) are definitely established and need no defense" (cited in Thacker & Banta, 1983, p.324). The routine prophylactic performance of episiotomy is rarely questioned in the medical literature and has not been scientifically evaluated since it was first recommended by Pomeroy in 1918 and De Lee in 1920 (Thacker & Banta, 1983).

It was not until 1967 that midwives were encouraged to perform an episiotomy. Prior to this time they had not been allowed (Willmott, 1980). For this reason many midwives took pride in their skill at delivering babies over an intact perineum or with only minor lacerations. Today, the indications for episiotomy and its technique are a standard part of a midwife's training and are considered entirely acceptable. In fact, perineal lacerations, however slight,

are now often regarded as evidence of mismanagement of the delivery (Wilkerson, 1984).

Benefits of Episiotomy

Most modern midwifery and obstetric textbooks explain episiotomy quite simply and recommend it on the basis of the benefits or indications for the procedure. They do not, however, mention the risks involved (Bennett & Brown, 1989; Clayton et al., 1985; Cunningham et al., 1989; Llewellyn-Jones, 1971; Oxorn, 1986; Towler & Butler-Manuel, 1980). Cunningham et al. (1989) briefly state "recently, the advantages provided by episiotomy have been questioned by some individuals" (p.323). They conclude their discussion by commenting that the important questions for the obstetrician concerning episiotomy are - the proper timing, type of incision, whether to repair the episiotomy before or after expulsion of the placenta, and what are the best suture materials and technique for repair.

There are four reported benefits for episiotomy:

1.   Prevention of pelvic relaxation. Over-distension of the perineum is believed to lead to muscle damage and eventual genital prolapse.

2.   Prevention of trauma.

3.   Prevention of fetal brain damage.

4.   Ease of repair.

These reported benefits, however, do not withstand scientific scrutiny. In an extensive review of all English language literature published between 1860 and 1980, on the benefits and risks of episiotomy, Thacker and Banta (1983) showed that most research studies on episiotomy have addressed alternative techniques for the procedure rather than questions of its efficacy and safety. The review made it clear that there are no data available to support the reported benefits of episiotomy or its extensive use.

1. **Prevention of Pelvic Relaxation**.

Prevention of long-term damage to the pelvic floor is the most frequently cited reason for performing an episiotomy. The inference is that poor perineal tone increases the risk of cystocele, rectocele, uterine prolapse, and stress urinary incontinence.

Most proponents of the argument that episiotomy causes less pelvic relaxation, cite two 1935 studies, by Aldridge and Watson, and Nugent. Both studies showed decreased pelvic damage among women undergoing episiotomy (Banta & Thacker, 1982). However, Aldridge and Watson clearly identified their bias toward the acceptance of episiotomy as a routine procedure (Thorp & Bowes, 1989).

Thacker and Banta (1983) suggest that the changes in the family structure during this century may have an important confounding effect on the interpretation of temporal changes in pelvic relaxation rates. Women are having less children so the pelvic floor is being stressed less.

A study by Gainey, in 1955, compared two groups of 1000 women and evaluated the perineal outcome at two months to ten years after their deliveries. Gainey's (1955) results included several findings: there is greater protection to the vagina with episiotomy, increased damage on successive deliveries without episiotomy, and equivalent incidence of stress urinary incontinence and uterine prolapse between the two groups. Gainey (1955) acknowledged that the effect of repeated pregnancies undoubtedly plays a part in increased damage to the pelvic floor.

Pelvic floor muscle strength in 87 primiparous women with uncomplicated pregnancies was recently investigated in a study conducted by Rockner, Jonasson and Olund (1991). The pelvic floor muscle strength was evaluated, with the aid of vaginal cones, in the 36th week of pregnancy and repeated eight weeks postpartum. Seventy one participants delivered vaginally, while 16 underwent an elective caesarean section. The authors identified three subgroups in the group of women with vaginal delivery: episiotomy, spontaneous laceration and intact perineum. The results of the study indicated pelvic floor muscle strength was significantly weakest in the

episiotomy subgroup. No significant difference was evident between the spontaneous laceration and intact perineum subgroups.

The occurrence of pelvic tissue relaxation in nulliparous women and those delivered by caesarean section indicate aetiologic factors in addition to childbirth trauma. According to Llewellyn-Jones (1971) and Gordon and Logue (1985), the most important predisposing factor to genital prolapse is a congenital or developmental weakness of the pelvic supports. Gordon and Logue (1985) measured the perineal muscle function in a sample of 84 women one year after childbirth, by means of a perineometer. There were four study groups: those with an intact perineum; those with a second degree perineal laceration; those with episiotomy associated with normal vaginal delivery, and those in whom episiotomy was associated with forceps delivery. The groups acting as controls consisted of women who had caesarean section, and nulliparous midwives. The results of this study and a study by Nielsen et al. (1988) indicated that perineal damage had little influence on muscle function. Rather, the efficiency of the perineal muscles was found to be

significantly related to the extent to which the women took regular exercise and not to the mode of delivery. Even the women, in Gordon and Logue's (1985) study, who had caesarean section showed poor muscle function, although the perineum had not been traumatised at the time of delivery. Furthermore, several of the control group of midwives who had never been pregnant had poor muscle function.

The results of Gordon and Logue's (1985) study supports the work of Kegel (1948). Kegel (1948) described the mechanisms of injury to the perineal structures due to childbirth. The muscle tissue in the immediate proximity of the vaginal canal is in the area of greatest tension during labour and delivery. Yet, the injury to this "sphincteric zone" is minimised because of the resilience and elasticity of the tissues. In his article Kegel (1948) described his perineal muscle exercise as an exercise performed by contracting then relaxing the vaginal muscle groups. Kegel (1948) demonstrated that muscle exercise restores function and tone to the vaginal and perineal muscles, improves early cystocele and rectocele and relieves urinary stress incontinence.

The exercise is still referred to as Kegel's or postpartum exercise today (Wells, 1990) and is advocated by health professionals throughout the world as a means of training the pelvic floor muscles and relieving urinary stress incontinence (Avery & Burkett, 1986; Henalla, Kirwan, Castelden, Hutchins, & Breeson, 1988; Nielsen et al., 1988; Sampselle, 1990).

2. **Prevention of Trauma**.

The only commonly reported index of severe perineal trauma in the literature is third (and fourth in the US) degree lacerations. Trauma to the upper vagina and anterior vaginal introitus is consistently under-reported (Thacker & Banta, 1983).

There is little evidence in the literature to support the argument that episiotomy limits the incidence of third degree tears and, in fact, there is evidence to the contrary. Third degree tears appear to be more common in women who have had an episiotomy. This has been demonstrated in several recent studies, suggesting a direct association of episiotomy,

particularly midline episiotomy, with an increased risk of injury to the anal sphincter (Borgatta, Piening, & Cohen, 1989; Dunne, 1984; Gass, Dunn, & Stys, 1986; Harris, 1970; Thorp, Bowes, Brame, & Cefalo, 1987; Wilcox, Strobino, Baruffi, & Dellinger, 1989). These studies revealed third degree extensions, with a rate ranging from 1.2% to 27.9%, occurring in women undergoing midline episiotomy. Borgatta et al. (1989) were the only authors to find third degree tears among the women on whom an episiotomy was not performed. Their reported rate was 0.9% of 241 women.

Buekens, Lagasse, Dramaix and Wollast (1985) investigated the relationship of mediolateral episiotomy to third degree extensions in 21,278 deliveries. With an episiotomy rate of 28.4%, third degree tears occurred in 1.4% of the deliveries with episiotomy and in 0.9% of deliveries without.

Two randomised studies have compared midline and mediolateral episiotomies to assess the consequences and benefits of each incision (Coats et al., 1980; Shiono, Klebanoff, & Carey, 1990). Coats et al. (1980) and Shiono et al. (1990) found midline episiotomies extended into third

degree tears in 23.9% and 9.7% of cases respectively, compared to 9.0% and 1.8% respectively, following mediolateral episiotomies.

Overall, these studies do not substantiate the belief that episiotomy offers a clear benefit to women in terms of decreased numbers of severe lacerations. Factors such as nulliparity, prolonged labour, instrumental delivery, and the skill of the operator may play a part in causation (Bromberg, 1986).

3. **Prevention of Fetal Brain Damage**.

Thacker and Banta (1983), in their extensive review of the literature, found that little data existed which evaluated the effectiveness of episiotomy in preventing fetal brain damage. The studies Thacker and Banta (1983) reviewed on cerebral palsy and severe mental retardation suggested that most factors leading to these problems occurred before labour and delivery.

In neurologic studies, Paciornik (1990) states that 12% of the population show cerebral dysrhythmia, and 1 in every 200 people suffer from epilepsy. From studies of primitive South American Indians, using encephalograms, Paciornik (1990) reports a much lower rate of 2% dysrhythmia and 1 in 600 cases of epilepsy. It is customary for this particular cultural group to give birth in a squatting position without episiotomy. Paciornik (1990) stresses that this is not a racial factor, as South American Indians in Western Society, born in the classical way, show dysrhythmia and epilepsy in the same proportions as the Western Society population.

Two controlled studies analysing the effect of the length of the second stage of labour on fetal outcome have been reported. In one study, 22 women with uncomplicated pregnancies were randomly allocated into "fast" and normal delivery groups (Wood, Ng, Hounslow, & Benning, 1973). The "fast" delivery group were encouraged to push, had an early episiotomy, and had a forceps delivery in cases of delay. Results indicated that there were no significant differences in mean Apgar scores or scalp blood pH, but umbilical artery mean values of pH, pCO^2 and O_2 were slightly more favourable

in the "fast" delivery group. The sample size was too small, however, for accurate assessment of all the factors that would have had an effect on the particular Apgar scores and blood gas outcomes mentioned ($\underline{N}$ = 29).

The second study retrospectively compared 96 low risk primigravid women, who delivered with an intact perineum, to 84 who underwent episiotomy (Bowe, 1981). The outcome measures were the newborn's Apgar score at one and five minutes. At one minute there was a statistically significant difference, with a slightly lower Apgar score for the episiotomy group. No differences were found between the two groups at five minutes.

Similarly, in two randomised controlled studies reported in 1984, the authors found no significant differences in Apgar scores between episiotomy and non-episiotomy spontaneous vertex deliveries (Sleep et al., 1984; Harrison, Brennan, North, Reed, & Wickham, 1984).

There appears to be no data available on preterm babies and episiotomy.

4. **Ease of Repair**.

This final reported benefit of episiotomy is never specifically addressed in the literature. Current opinion is based on clinical impressions, not on data from studies (Thacker & Banta, 1983).

The opinion that a straight cut is easier to repair than an irregular tear has been refuted by several authors (Lee, 1982; Paciornik, 1990; Thorp et al., 1987). Paciornik (1990) found that when tears occurred they were neither extensive nor irregular and were easier to repair than episiotomies, particularly, Lee (1982) argues, the "bizarre" vaginal wound produced by mediolateral episiotomy.

Risks of Episiotomy

Episiotomy, as with other surgical interventions, has certain risks which are often considered trivial. The most commonly reported problems are postpartum pain and dyspareunia. Other frequently reported risks include the direct association of episiotomy with an increased risk of

the incision extending to a third degree tear (Buekens et al.
1985; Dunne, 1984; Gass et al., 1986; Reynolds & Yudkin,
1987; Thorp et al., 1987; Wilcox et al., 1989), increased
blood loss during childbirth (de Leeuw, Lowenstein, Tucker,
& Dayal, 1968; Newton, Mosey, Egli, Gifford, & Hull, 1961),
infection leading to extensive wound breakdown (Garner, 1982;
Livingstone, Simpson, & Naismith, 1974; O'Leary & O'Leary,
1965; Ruparelia, Iqbal, & Johnson, 1990; Sieber & Kroon,
1962), and unsatisfactory anatomic results (Beischer, 1967).
Any of these problems can occur to a degree that interferes
with the new mother's ability to function (Thacker & Banta,
1983).   In addition to these common complications, other
relatively rare problems include endometriosis in the
episiotomy scar (Paull & Tedeschi, 1972) and non-healing of
the episiotomy (Thacker & Banta, 1983). At the extreme of
severity, several maternal deaths have been attributed to
episiotomy (Ewing, Smale, & Elliott, 1979; Golde & Ledger,
1977; Shy & Eschenback, 1979).

     Thacker and Banta (1983) made particular note that there
were no published studies, prior to 1980, directed at
determining the risk or side effects of episiotomy, although

evidence of these unwanted effects, such as postpartum pain
is now accumulating (Kitzinger & Walters, 1981; Reading,
Sledmere, Cox, & Campbell, 1982).

1. **Postpartum Perineal Pain**.

Pain at the episiotomy site is the major disadvantage
following childbirth. It is claimed, particularly when local
anaesthesia is inadequate, that episiotomy is painful when
performed and during suturing, and immediately postpartum and
long-term (Kitzinger, 1981). Referring to episiotomy in
primiparae, Robinson et al. (1980) suggested that the pain
caused by sutures in the perineum was considerable and the
related degree of discomfort was as high as the rating of
pain in labour. Perineal pain can distract the mother and
interfere with the initial bonding process with her baby.
The pain can also make breastfeeding more difficult by the
discomfort of sitting and by inhibiting the hormonal milk
let-down reflex. A normal reflex results in milk being
released from the glands of the breasts and is necessary for
successful lactation (Varney, 1987).

Research into women's experiences of episiotomy and the subsequent suturing of the perineum has only been carried out since 1980. Five studies have been reported (Abraham, Child, Ferry, Vizzard, & Mira, 1990; Cater, 1984; Kitzinger & Walters, 1981; Larsson et al., 1992; Reading et al., 1982). In the studies conducted by Cater (1984) and Kitzinger and Walters (1981) the authors compared the perineal discomfort experienced among three groups of women: those receiving an episiotomy, those sustaining perineal, vaginal and labial lacerations, and those delivering over an intact perineum. While Cater (1984) surveyed 315 women for the first five days following vaginal delivery, Kitzinger and Walters (1981) surveyed 1795 women for an unstated, but implied, duration of several months. Although the actual percentages differed in their results, the ratio differences in pain ratings found between the three groups of women were consistent in each study. Significantly more women with episiotomy described their discomfort as mild to severe pain, compared with the laceration group women. A minority of the intact perineum group in each study complained of mild pain only (Cater, 1984; Kitzinger & Walters, 1981).

Comparisons were made between episiotomies and spontaneous perineal lacerations in the studies carried out by Abraham et al. (1990) and Larsson et al. (1992). Abraham et al. (1990) surveyed 93 women by monthly questionnaire for up to twelve months postpartum to determine the duration of perineal discomfort, whilst Larsson et al. (1992) surveyed 1889 women for the first five days to elucidate the levels of pain experienced, then included an eight to twelve week follow-up examination of the women to determine the levels of residual pain and healing problems the women in the two groups had incurred.

In their report, Abraham et al. (1990) did not differentiate between the episiotomy and tear groups with respect to the time for the perineum to feel comfortable. However, their results indicated that it took more than two months for 20% of the women to regain general perineal comfort, and five months before 20% of the women were able to experience sexual intercourse with comfort.

In contrast to the Abraham et al. (1990) report, Larsson et al. (1992) found that the episiotomy group reported

significantly more severe perineal pain on the day following delivery, but by eight to twelve weeks the difference was not significant. Significant differences, however, were found with healing problems from the perineum (scarring, asymmetry and perineal pain with palpation), and wound infection. Eleven percent of the episiotomy women had healing problems and 10% had wound infection diagnosed compared to 4.8% and 2%, respectively, of the women with perineal tears.

The fifth study surveyed 101 primigravid women who had received a mediolateral episiotomy. Reading et al. (1982) found that 80% of these women experienced discomforting or worse episiotomy pain following delivery. Thirty one percent of the women subsequently developed problems with the episiotomy and its repair and had to seek professional help.

Three large randomised control trials of "restrictive" versus "liberal" use of episiotomy were published in 1984 and 1986 (Harrison et al., 1984; House, Cario, & Jones, 1986; Sleep et al., 1984). The restrictive policy limited episiotomy to essential indications, whilst in the liberal policy episiotomy was performed to prevent perineal tears.

Reductions in episiotomy rates, to 8% (Harrison et al., 1984), 10% (Sleep et al., 1984) and 40% (House et al., 1986), were reported for the restrictive groups during the studies, with corresponding rises of intact perinea.   However, 62% (Sleep et al., 1984) and 71% (Harrison et al., 1984) of these women in the restrictive policy groups sustained lacerations. The severity of pain reported by the women in the two policy groups, those who had undergone episiotomy and those who had sustained tears, were compared.   No significant differences were found between the two groups in the studies (Harrison et al., 1984; House et al., 1986; Sleep et al., 1984), except that the restrictive group in the House et al. (1986) study experienced less severe pain on the third postnatal day.

2.   **Dyspareunia.**

Dyspareunia (painful intercourse) caused by pain and tenderness at the episiotomy site is the most dominant factor hampering women in re-establishing the sexual bond after childbirth (Lumley, 1978).

Reports of early resumption of sexual intercourse indicate that before three months postpartum 60% (Reading et al., 1982) to 85% (Buchan & Nicholls, 1980) of women with episiotomies experience persistent dyspareunia. The reported rates at three months postpartum vary between 20% and 24% (Abraham et al., 1990; Garner, 1982; Isager-Sally, Legarth, Jacobsen, & Bostoffe, 1986; Sleep et al., 1984), with between 9% and 18% of women continuing to report painful intercourse due to perineal pain and tenderness beyond six months (Abraham et al., 1990; Garner, 1982; Kitzinger & Walters, 1981; Thranov et al., 1990). Two studies providing follow-up three years after delivery found between 8% and 16% of women still suffered from dyspareunia (Sleep & Grant, 1987; Spencer, Grant, Elbourne, Garcia, & Sleep, 1986).

3. **Extension of the Episiotomy Incision.**

Recent studies suggest there is a direct association of episiotomy with an increased risk of the incision extending to the anal sphincter or rectal mucosa (Buekens et al., 1985; Dunne, 1984; Gass et al., 1986; Reynolds & Yudkin, 1987; Thorp et al., 1987; Wilcox et al., 1989). Episiotomy

extensions occur more often with a median episiotomy than with a mediolateral incision (Coats et al., 1980; Sieber & Kroon, 1962; Shiono et al., 1990).

Complications of third degree tears include rectovaginal fistulae, loss of anal sphincter tone and perineal abscess formation (Given & Browning, 1988; Harris 1970; Thorp et al., 1987). Given and Browning (1988) reviewed 32 patients whose old complete perineal lacerations were repaired in ten hospitals over a twenty year period. The chief complaint among these patients was incontinence of faeces and flatus. Although 85% of the women regained complete continence after surgery, 7.5% of the women achieved only fair results, that is, control over normal bowel stools but with some incontinence of gas or liquid stools. Surgery in a further 7.5% of women failed to give any improvement to their incontinence. Three patients had undergone a previous attempt at repair that had failed. The time of repair in this study varied from six weeks to 29 years, with an average of greater than four years.

4. **Increased Blood Loss**.

An episiotomy commonly causes increased blood loss during childbirth. In multiparas and primiparas the blood loss measured during delivery was significantly greater in patients receiving an episiotomy as compared to women who had neither episiotomy nor laceration (Newton et al., 1961; de Leeuw et al., 1968). A loss of 153 millilitres of blood was attributed to episiotomy in the study by Newton et al. (1961), although Thacker and Banta (1983) suggest an increase of 300 millilitres or more occurs for about ten percent of women having an episiotomy.

5. **Infection**.

Infection is a recognized complication of episiotomy. Perineal wounds are susceptible to infection because of contamination by pathogens from the vagina, the lower intestinal tract and from infected amniotic fluid or lochia. Routine vaginal examinations performed during labour also predispose women to the introduction of infection (Ruparelia et al., 1990).

Episiotomy associated infections include febrile morbidity, 0,9% (O'Leary & O'Leary, 1965), stitch abscesses, 8% (Sieber & Kroon, 1962) and wound infections in 6% (Livingstone, Simpson, & Naismith, 1974) to 12% (Garner, 1982) of women, often leading to extensive wound breakdown (Ruparelia et al., 1990).

A recent study by McGuinness, Norr and Nacion (1991) compared perineal healing between 181 women with episiotomy and 186 women without episiotomy between one to two weeks after delivery. Overall, the researchers found there was a 4.9% incidence of delayed perineal healing due to wound separation or clinical infection. Significantly more women in the episiotomy group (7.7%) experienced delayed perineal healing compared with 2.2% of the women without episiotomy.

Although the repair techniques and suture materials used have been implicated as causal factors in perineal wound breakdown, the dehiscence (wound breaking open) is often due to infection (Ruparelia et al., 1990). Infection was reported to be aetiologic in 39% of the 31 patients

undergoing repair of episiotomy dehiscence by Hankins, Hauth, Gilstrap, Hammond, Yeomans, and Snyder (1990).

Episiotomy infections can have potentially severe or even fatal consequences. Shy and Eschenbach (1979) reported three episiotomy related deaths in Seattle for the period 1969 to 1977. These deaths accounted for 20% of the maternal mortality in King County, Washington. Two patients had necrotizing fasciitis (death and infection of the connective tissue or fascia) and one had clostridial myonecrosis (death of a portion of the muscular tissue). Likewise, Ewing, Smale, and Elliott (1979) studied 49,007 births in Kern County, California between 1969 and 1976. There were 11 maternal deaths, three of which were due to episiotomy related infection. Another four cases of postpartum necrotizing fasciitis were reported in Southern California between 1967 and 1976 (Golde & Ledger, 1977). Three of these women had vaginal deliveries with episiotomy while the fourth had a caesarean section. Necrotizing fasciitis developed in the perineal incision of the first three patients and in the abdominal incision of the latter. Two of the women with episiotomies subsequently died.

6. **Unsatisfactory Anatomic Results.**

Unsatisfactory anatomic results of episiotomy repair were reported by Beischer (1967) in 50% of 237 women available for study from a series of 549 women undergoing mediolateral episiotomy. The most frequent problems reported by Beischer (1967) included "rounded" perineum with loss of perineal body, hardening and numbness of the perineum, and excessive narrowing or enlargement of the vaginal opening.

Recto-vaginal fistulas are sometimes seen as long-term complications of episiotomy and extension into third degree tears (Beynon, 1974; Hankins et al., 1990; Harris, 1970; Monberg & Hammen, 1987). Although the incidence of recto-vaginal fistulae were only one or two (0.03% to 9.1%) in each of these studies, fistulae do cause significant morbidity to those women whose lacerations do not heal successfully. More days are spent in hospital by these women for surgical repair and convalescence and sexual, gynaecological and cosmetic defects subsequently develop (Monberg & Hammen, 1987).

Significant complications include a 10% failure rate of fistula repair (Given & Browning, 1988), 10% persistent dyspareunia and an 18% incidence of stool or flatus incontinence (Hankins et al., 1990).

Summary

It is generally assumed that episiotomy prevents the most serious tears to the perineum, prevents genital prolapse, and decreases the chance of damage to the fetal brain. However, a review of the literature indicates there is little, if any, scientific evidence to support these alleged benefits of routine episiotomy, despite being stated as fact in most obstetric and midwifery textbooks. Moreover, there are significant risks associated with episiotomy that have not been adequately studied.

In addition to the emotional distress caused to women, the risks of episiotomy include short and long-term pain, dyspareunia, extension of the incision, increased blood loss, infection, and unsatisfactory anatomic results. Some women will suffer the misery of perineal breakdown and possible re-

suturing. Any of these complications can occur to a degree that interferes with the new mother's ability to function. At the extreme of severity, several deaths have been attributed to episiotomy.

The currently available literature concerning the use of episiotomy raises a few unanswered questions. There are medical circumstances when an episiotomy is a valuable procedure and should be performed, but whether an episiotomy is truly of benefit to the majority of women, as opposed to a laceration or intact perineum, remains to be determined.

Finally, to quote Grant (1986) "Research into the repair of episiotomies and perineal tears may be considered unglamorous in some circles. But there can be no doubt about its relevance for improving the comfort of literally hundreds of thousands of women worldwide." (p. 419).

Chapter 3

Conceptual Framework

Dorothea Orem's General Theory of Nursing

The conceptual framework guiding this study was derived
from Orem's general theory of nursing (self-care deficit
theory). The major tenet of Orem's theory is the concept of
self-care, defined by Orem (1985) as "the production of
actions directed to self or to the environment in order to
regulate one's functioning in the interests of one's life,
integrated functioning, and well-being" (p. 31). Orem (1985)
specifies that the 'action system' in self-care is
deliberate. The human ability for engaging in self-care is
described by Orem (1985) as self-care agency. When the self-
care demand of a person exceeds that person's agency, or
ability, that person experiences a self-care deficit, and
thus there is a need for nursing intervention.

Following childbirth one of the most important roles of
the midwife is to encourage self-care. This includes

assessment of a woman's self-care ability relative to the expected outcomes of childbirth. In order to guide a woman towards self-care it is important that the midwife understand the relatively predictable outcomes of perineal trauma. This study attempted to gather empirical information related to perineal trauma and women's perceptions of perineal trauma to provide a basis for guiding clients towards self-care.

Orem (1985) perceives nursing as a science, technology, art, and a helping service given to persons with a legitimate need for it by nurses who have specialized knowledge and skills. Nurses help clients meet existing or anticipated demands for self-care in order to "sustain life and health, recover from disease or injury and cope with their effects" (p. 54).

Application of the Theoretical Concept of Self-Care to the Study

The focus of this study was on the short and long-term effects of episiotomy and perineal lacerations following childbirth. The results of the survey will provide midwives with precise knowledge of these effects and will serve to strengthen and integrate the theory base and practice base for perineal management. Conceptualized within Orem's self-care theory, this knowledge can be implemented in practice by fostering a normative/re-educative process of teaching for both midwives and clients.

The data should provide impetus and direction for midwives to evaluate their perineal management standards and techniques, in a deliberate and purposeful manner, leading to a revision in their decision-making and clinical practice skills. Further, the knowledge gained will assist midwives in providing pertinent support and education to their clients, so that the clients will rightfully be able to participate in the decision-making.

Nursing intervention will be necessary if the women are unable to maintain self-care actions which are therapeutic in recovering from the perineal trauma or coping with the effects of the trauma. Nursing care may need to be focused on the following: first, expanding the women's knowledge of the predicted levels of pain experienced and how the trauma may affect them; second, expanding the women's knowledge of perineal management and choice of the most appropriate pain-relieving methods; and third, expanding the women's self-care capabilities to overcome future problems or consequences of perineal trauma and their adaptation to the motherhood role.

A descriptive diagram of the application of Orem's theoretical concept of self-care to the study, is provided in Figure 3.

```
┌─────────────────────┐
│     CHILDBIRTH      │
└─────────────────────┘
           │
           ▼
┌─────────────────────────────────┐
│       PERINEAL INTEGRITY        │
│   episiotomy  tears  intact perineum │
└─────────────────────────────────┘
```

┌────────────────────────────────┐   ┌────────────────────────────────┐
│ POSTNATAL PAIN EXPERIENCE   │   │ PHYSIOLOGICAL OUTCOMES   │
│   – self-reported   │   │   – REEDA indicators   │
└────────────────────────────────┘   └────────────────────────────────┘

                    ┌─────────────────┐
                    │   EMPIRICAL   │
                    │   DATA   │
                    └─────────────────┘

┌──┐
│   MIDWIVES' KNOWLEDGE   │
│ ·improvement in midwives'understanding of perineal pain and pain control │
│ ·evaluating own practice and revising perineal management   │
│ ·integrating theory base and practice base   │
│ ·decision-making during childbirth   │
│ ·anticipating associated problems with perineal trauma   │
└──┘

┌──┐
│   CLIENT GUIDANCE   │
│ ·predictable pain levels and effects of perineal trauma   │
│ ·participation in decision-making   │
└──┘

┌──┐
│   CLIENT'S ABILITY TO SELF-MANAGE   │
│   · anticipating pain experience   │
│   · pain relief   │
│   · adaptation to motherhood role   │
│   · overcoming associated problems   │
└──┘

Figure 3. A Model for Guiding the Postnatal Client
Toward Self-Care.

Major Variables

The major variables identified in this study were:

Dependent Variable:

1. Pain, reported by the participants.

Independent Variables:

1. Method of vaginal delivery, of the newborn.
2. Type of perineal trauma, sustained by the participants.
3. Suturing method, used by the person carrying out the perineal repair.
4. Suture material, used for the perineal repair.
5. Birthweight, of the newborn.
6. Anaesthesia, used for perineal suturing.

Operational Definitions

Pain - an increased sensation of discomfort. Measured by the participants' self report and visual analogue scale.

Method of Delivery - the method by which the newborn is delivered vaginally. Four categories are defined:

1.   Spontaneous vaginal delivery - a vaginal delivery occurring naturally with no external aid.

2.   Forceps delivery - a vaginal delivery with obstetric forceps applied to the fetal head to assist expulsion.

3.   Vacuum Extraction - a vaginal delivery with a vacuum extractor cup applied to the fetal head to assist expulsion.

4.   Breech delivery - delivery of a fetus presenting by the breech; may be spontaneous, assisted with forceps applied to the after coming head, or assisted with a manual breech manoeuvre.

Each category was mutually exclusive for the purpose of this study; that is, a participant was assigned to only one category.

Type of Perineal Trauma - the type of trauma sustained to the perineum, vagina or labia during delivery.

Six categories are defined:

1. Episiotomy - an intentional incision of the perineum, irrespective of size.

2. Episiotomy plus tear - an intentional incision of the perineum associated with further extension into a second or third degree tear, vaginal wall tear or labial tear.

3. First degree tear - a laceration which involves the superficial vaginal mucosa or perineal skin only.

4. Second degree tear - a laceration which involves the muscle of the perineal body. May be slight or severe.

5. Third degree tear - a laceration in which the anal sphincter is involved, irrespective of whether or not the rectal mucosa is torn.

6. Labial or periurethral tear - a laceration in which the anterior labia minora, clitoris or periurethral mucosa is involved.

These perineal states were mutually exclusive except for a third degree tear, which could occur with episiotomy.

<u>Suturing Method</u> - the techniques used for suturing the muscle
layers of the perineal body and the skin of the perineum.

1. Muscle layers - may be:

    a. interrupted, where each individual suture is knotted
       and cut.

    b. continuous, a continuous side to side suture.

2. Perineal skin - may be:

    a. subcuticular, a continuous side to side suture
       immediately beneath the skin layer.

    b. transcutaneous, interrupted sutures individually
       knotted and cut.

Each category was mutually exclusive in the study.

<u>Suture Material</u> - the type of suturing "thread" used for
suturing the episiotomy or perineal tear. Three categories
are used:

1. 00 Chromic Catgut.

2. 00 Vicryl.

3. 00 Dexon.

Each category was mutually exclusive in the study.

<u>Birthweight</u> - weight of the newborn at birth, measured in grams.

Differences in birth weight can account for differences in the degree of perineal trauma and therefore could cause significant differences in pain sensation.

<u>Anaesthesia</u> - the type of anaesthesia/analgesia used to numb the perineal area in preparation for suturing.

Anaesthesia/analgesia may be of three kinds:

1.   Local infiltration of the perineum with lignocaine (Xylocaine).

2.   Regional lumbar epidural block.

3.   General anaesthesia.

Epidural block may affect the intensity of perineal pain experienced by the participants immediately postpartum. Each category was mutually exclusive in the study.

Assumptions

The assumptions upon which this study was based were:

1.   The midwives in the study hospital were guided by hospital policy when determining the need for episiotomy with individual clients.

2.   The hospital policy guiding the midwives' decision for episiotomy is biased towards avoidance of episiotomy if possible.

3. The survey responses were a true reflection of the degree of pain or discomfort experienced by the participants at the time.

Chapter 4

Methodology

This chapter identifies the research design used in the study, and describes the setting and sample selection. The instrumental procedures used for data collection are then discussed in terms of their methodological and ethical viability.

Research Design

A survey design was used in this quasi-experimental study to compare the relative amount of pain experienced by women during childbirth. Four groups of women were compared: those undergoing episiotomy, those sustaining first degree perineal tears or vaginal lacerations, those sustaining second degree perineal tears, and those who had no perineal injury.

The survey design was selected as appropriate to a large sample number (approximately 1,000 expected) because it

provided a confidential and anonymous way of collecting quantifiable information on participant's perception of their pain experience and the effects of perineal trauma across groups of women with varying degrees of perineal trauma.

In order to answer questions about the differences in pain perception levels in varying degrees of perineal trauma there are many confounding factors whose effect is difficult to predict "a-priori" and therefore this quasi-experimental study was an advantageous means of answering those questions and lay the basis for further studies which may be suggested by the results.

The main hypothesis tested in this study concerned the extent to which the incidence, intensity or duration of perineal pain varied according to whether a woman had experienced an episiotomy, perineal lacerations or an intact perineum following vaginal delivery.

Setting

The setting for this study was a 250 bed women's hospital in Perth, Western Australia, where approximately 4,500 deliveries are conducted each year. The hospital is the major obstetric teaching hospital and serves as the tertiary care and referral centre for the State. The population attending this hospital is comprised of all socio-economic groups and included 13.2% non-caucasian immigrants and 6.8% Aborigines in 1989 (Health Department of W.A.).

The investigator is an experienced midwife with 21 years midwifery experience and is currently employed by this hospital, as the Clinical Nurse Specialist in the Delivery Suite.

Population and Sample

The study investigated a convenience sample of women selected from the accessible population of 2,071 pregnant women confined at this hospital during a six month period from July 1, 1991 to December 31, 1991. Of the total number

of women confined, 928 participants were eligible to be included in the study group on the basis that they had had a vaginal delivery of a live, healthy baby and had sustained an episiotomy or perineal laceration requiring surgical repair. One hundred and eighteen participants also having a vaginal delivery of a live, healthy baby, but without sustaining any perineal or vaginal trauma were selected in consecutive order to serve as the control group. If the women did not meet the inclusion criteria a replacement was selected until 101 women formed the control group. The extra participant in the control group was the result of an inadvertent mistake with the numerical coding of the first questionnaire.

The following criteria were used for inclusion. Criteria were:

1. Willingness to participate in the study.

2. An ability to read, write and comprehend the English language because the study involved the understanding and completion of two postal questionnaires.

3. A history of having experienced no significant medical, obstetric, or psychiatric complications that would affect the healing process or ability to complete the questionnaires.

Of the 928 women eligible to be selected for the study group 104 were not available to the study. Of the 104 women, 25 women (16 Caucasian, 7 Aboriginal, 1 Maori, and 1 Chilean) refused to participate. The reasons given for refusal included: continually changing address or moving interstate and therefore the re-directing of questionnaires posed a problem to them (n = 7), involvement in another large cohort study (n = 2), "too busy" (n = 1), and "didn't feel like it" (n = 4). The parents of a 15 year old girl refused consent. The girl was willing to participate and comprehended English well, however, her parents' ability to comprehend English was limited. The remaining ten women gave no reason. Nine women (2 Caucasian, 3 Aboriginal, 2 Maori, and 2 Asian) withdrew their consent prior to receiving the first questionnaire. Eight of the women did not give a reason, but the ninth felt that she would be too embarrassed to answer the sex related questions, and; 13 women (9 Caucasian, 3 Aboriginal and 1 Maori) were discharged from hospital to return to country

areas outside the Hospital's domiciliary care area, and were thus unavailable for follow-up on the third postnatal day. Fifty six women (43 Asian and 13 Caucasian) were excluded because of an inability to comprehend the English language. Only one woman was excluded because of a psychiatric disorder. The final study group sample included 824 participants.

One hundred and eighteen women with an intact perineum, were initially selected in a consecutive order to serve as the control group, however, 17 were excluded because they did not meet the study criteria. Four women (1 Caucasian and 3 Aboriginal) refused to participate, two Caucasian women withdrew their consent (no reasons were given for refusal or withdrawal), and 11 women (8 Asian and 3 Caucasian) were excluded because of their inability to comprehend the English language. The final control group included 101 participants.

Data Collection Instruments

Data were collected using a series of four structured questionnaires developed for the study (see Table 1). The questionnaires, based on the review of midwifery and medical research on episiotomy, were developed by the author and have no demonstrated reliability or validity. Essential items were selected and modified from questionnaires developed and used with similar research in the United Kingdom (Flint & Poulengeris, 1987; Harrison et al., 1984; House et al., 1986; Kitzinger & Walters, 1981; Sleep et al., 1984).

.

Table 1

Questionnaire Timetable

Time	Questionnaire
Following delivery	Questionnaire to staff
3 Days after delivery	Questionnaire to mothers
6 Weeks after delivery	Questionnaire to mothers
3 Months after delivery	Questionnaire to mothers

The four questionnaires used in the study are described below:

1. The Demographic/Obstetric Data Questionnaire contained 18 items for completion by the person performing the perineal repair. Items included the participants age, duration of labour, method of delivery, blood loss, birth weight, type of perineal trauma, indication for episiotomy if performed, material and techniques used for perineal repair, and professional status of the perineal repairer (see Appendix A).

2. Participant Questionnaire 1, including a clinical examination section, was a 19 item tool for completion on the third postnatal day. The first 13 items were designed to elicit the incidence and intensity of perineal pain, need for analgesia, presence of haemorrhoids, and antenatal class attendance from the participants (see Appendix B).

The first four items on perineal pain intensity, one of which pertained to pain felt during suturing, were assessed by the participants using a 100 millimetre visual analogue scale. The scale represented the range from 0, 'no pain' to

10, 'pain as bad as it can be'. Participants were asked to place a mark on this line to represent their feeling of pain experienced, which was then calculated as a percentage of the line length. For the purpose of this study, 0-30mm was regarded as mild, 31-70mm as moderate, and 71-100mm as severe pain.

It was intended to use the short-form McGill Pain Questionnaire, developed by Melzack, for this study. The McGill Pain Questionnaire uses 11 word descriptors to represent the sensory dimension of pain experience and four word descriptors to represent the affective dimension (Melzack, 1987). However, when the Questionnaire was presented to 20 mothers in a pre-test only four of the sensory words were chosen by some of the mothers. For others, the words were not the words they would use when describing the perineal pain they were experiencing. Further, not one of the mothers would have chosen the affective words. Therefore the McGill Pain Questionnaire was not used in the study. Instead, one item was included in the first participant questionnaire asking the participants to describe their pain experience using their own words. To

analyse this qualitative data the participant's responses were examined to determine if there was a pattern. Similar responses then formed categories of sensory, affective and evaluative word pain descriptors.

The remaining eight items in the first participant questionnaire required the participants to tick the appropriate fixed-alternative responses.

The final six items in Participant Questionnaire 1 was completed by independent midwife observers. Five clinical examination items on the presence and degree of perineal redness, (o)edema, ecchymosis (bruising), and discharge from, and approximation of, the perineal wound were scored using the REEDA scale (Davidson, 1974). Based on this scale these five signs were scored on a 0 to 3 basis by direct visualization and linear measurement using a tape measure. The sixth item elicited whether antibiotics were prescribed for perineal wound infection.

The REEDA scale was used in this study because the tool gave specific measures and was therefore considered by the

researcher to be a potentially more accurate and objective scoring process to describe the perineal healing and relate it to the discomfort or comfort experienced by the participants.

3. Participant Questionnaire 2, (see Appendix C), containing 14 items, and;

4. Participant Questionnaire 3, (see Appendix D), containing nine items, were designed to identify persisting perineal pain or discomfort, problems encountered with the healing of the perineum, resumption of sexual intercourse, and dyspareunia. These questionnaires were posted to the participants six weeks and three months, respectively, following delivery.

The visual analogue scale was used for seven items on pain intensity in Participant Questionnaire 2, and one item in Participant Questionnaire 3. The remaining eight items in Participant Questionnaire 2 and eight items in Participant Questionnaire 3 required fixed-alternative responses from the participants.

Reliability and Validity

Pre-testing of each questionnaire for reliability and validity for this study was carried out by the researcher. Twenty recently delivered mothers were approached in the postnatal wards and were asked to fill in the questionnaires (the women represented three racial groups and all socio-economic levels). They were then informally interviewed to check their verbal answers against their written responses. Data obtained from the questionnaires and interviews yielded a high degree of concordance and so it was concluded that the questionnaires achieved a measure of concurrent validity.

Face validity of the four questionnaires and the REEDA scale was assumed on the basis that the tools were judged by the midwife-author to be appropriate for the information required.

Content validity of the four questionnaires and the REEDA scale was assumed on the basis that the questionnaire items were derived from the relevant literature and subsequently reviewed by four obstetricians and senior

midwives who verified the appropriateness of the content. These "experts" and the women pre-testing the questionnaires were asked to make suggestions as to deletions or addition of items and organisation of the tools. Only minor modifications were made as a result of their suggestions.

Construct validity of the REEDA scale was supported in a previous study using the tool (Hill, 1989) by the association found between the condition of the perineum and pain reported by the participants.

Previous studies have compared the visual analogue scale and graphic rating scale to clarify issues of sensitivity of measurement, reliability and validity, and ease of patient use (Maxwell, 1978; Ohnhaus & Adler, 1975; Revill, Robinson, Rosen, & Hogg, 1976; Scott & Huskisson, 1976). Very high correlations were found with these scales with pain severity measured by the simple descriptive pain scale. For example, Ohnhaus and Adler (1975) and Revill et al. (1976) found strong correlations ($\underline{r}$ = 0.81 to 0.976, $\underline{p}$ <.001) between the two. The authors concluded the visual analogue scale was an

accurate, reliable, valid, and sensitive tool for measuring
pain levels in a variety of pain situations.

Data Collection Procedures

The collection of data for this project was spread over
a ten month period, thus allowing for the return of the three
month follow-up questionnaires from the final participants of
the six month study period. The researcher was responsible
for the distribution of the four questionnaires and collation
of all data.

The initial Demographic/Obstetric Data Questionnaire
(D/ODQ) was attached to the set of statutory Birth
Notification forms completed by the attending midwife
following every delivery. The questionnaires were completed
with an addressograph label and details only if the women
were eligible to be included in the study. Eligibility was
based on the women having given birth to a live, healthy baby
and requiring perineal repair, or on being one of the first
100 women sustaining no trauma to the perineum.   In the
majority of cases, the attending midwife completed the D/ODQ

with pertinent suturing details supplied by the person carrying out the perineal repair. The completed questionnaires were kept in a locked cupboard in the office when the researcher was off duty and collected each day. The researcher checked the birth register daily against the completed questionnaires to ensure that no eligible women were missed.

Initial contact was made, by the researcher, with all potential participants either in the delivery ward following their delivery or in the postnatal ward on their first postpartum day. Women who met the selection criteria were given a full explanation of the study and an invitation to participate in the study. Respondents who were willing to participate were given two consent forms to sign which reiterated the purpose and benefits of the research and what their involvement as a participant would entail (see Appendix E).

The original plan was to have an experienced senior midwife, independent to the study, personally distribute the first of the participant's postnatal questionnaires and

complete the six-item midwife's observation section attached to the questionnaire. However, despite the midwives' willingness to participate in this phase this task became impracticable due to their work commitments and the large number of participants to be seen daily in the four geographically separate postnatal wards. Therefore, the researcher assumed the role of distributing the questionnaires, with a covering letter, on the morning of the third day.

When delivering the questionnaires the researcher gave the participants verbal instruction on how to use the visual analogue scale and made arrangements to collect the completed form the following morning. The Clinical Nurse Specialists, and the experienced senior midwives looking after the participants in the postnatal wards, attended to the completion of the six-item midwife's observation section of the questionnaire.

Two domiciliary midwives distributed the questionnaires to the participants discharged home (within the hospital's domiciliary care area) before the third day (n = 41). The

midwives completed the six-item observation section and returned the completed forms to the researcher.

All of these initial questionnaires were coded with a number which was cross-referenced with the follow-up questionnaires.

The second and third participant questionnaires, together with covering letters and pre-paid return envelopes, were posted to the participants at six weeks and three months after the birth. If the participants did not return the questionnaire after three weeks of each distribution a replacement questionnaire was sent with a reminder letter stressing how important their contribution was. If the replacement questionnaires were not returned within three weeks of dispatch the researcher contacted the participants by telephone. The non-respondents in this study were participants who were either without telephones or were untraceable because they had moved residence without leaving a forwarding address.

One hundred and one (100%) participants with intact perinea and 824 (100%) participants requiring perineal repair returned their three day questionnaires. Respondents to the six week and three months questionnaires were the same; that is , the women who returned their six week questionnaire also returned their three month form. Ninety four (93%) participants with intact perinea and 738 (89%) participants requiring perineal repair responded to the six week and three month questionnaires.

The destinations and/or the postmarks of the questionnaires indicated how important the study was perceived to be by many of the participants. Six week and three month questionnaires were returned from various countries and islands around the world and throughout most of Australia. Overseas countries included England, the United States, Switzerland, New Zealand and New Guinea, whilst five participants returned their questionnaires from Christmas Island. Within Australia, respondents were representative of the majority of suburbs throughout the Perth metropolitan area and many country towns within and beyond a radius of 2,200 kilometres from the metropolitan area. In addition,

participants returned questionnaires from New South Wales, the Australian Capital Territory, Victoria, Tasmania, and South Australia.

Many of the respondents added personal notes to their questionnaires wishing the researcher success with the study and inviting the researcher to contact them again if they could be of any further assistance. This indicated that the study was seen, at least by mothers, to be addressing an important need.

Requests/pleas for help were received by the researcher from four of the respondents, three in the form of letters written on the final questionnaire and one by telephone. The four women were experiencing severe persistent perineal pain, urinary stress incontinence, infection and wound breakdown, and faecal incontinence. They all reported that they had consulted their general practitioners but, other than being prescribed antibiotics for the infection, were told by their doctors that there was nothing more that could be done to help. The researcher referred the four women to the

physiotherapy department at the hospital for free follow-up treatment.

Ethical Considerations

Several methods were used in this study to ensure the protection of human participants. The researcher presented the proposal to the Hospital's Ethics Committee and Edith Cowan University's Committee for the Conduct of Ethical Research for review to assure these committees that attention had been given to the rights of the participants involved, and to address the appropriateness of the methodology, and the risks and benefits of the study. Written approval for this study to proceed was given by both Ethics Committees. The study was also endorsed by the Hospital's Board of Management and Nursing Executive (see Appendices F, G, & H for copies of the letters).

Prior to the study commencing an explanatory letter was distributed to five senior midwives undertaking perineal repair, and all obstetric medical staff who worked in, or had visiting rights to the delivery ward. The letter explained

the reason for the study and requested their assistance in completing the Demographic/Obstetric Data Questionnaire when they had completed the perineal suturing (see Appendix I). The information required in the Questionnaire was a condensed version of the information normally documented in the nursing and medical sections of the patient's medical record.

The remaining midwifery staff in delivery ward were given a full written explanation of the study in the ward's communication book and a request for their assistance to ensure the Demographic/Obstetric Data Questionnaires were completed following the births they attended. Prior to the completion of the questionnaires the women were given a preliminary explanation of the study, by their attending midwives, with a request for verbal consent to complete the form and an assurance that the researcher would personally visit them following the birth to gain their informed, written consent for further participation in the study. None of the women refused to allow the questionnaire to be completed. For those subsequently refusing to proceed with the study the questionnaire was destroyed and only their code number and race retained by the researcher.

The ward communication book was regularly used by the researcher to document how the study was progressing and to express gratitude to the midwives for their support and assistance.

In addition, the postnatal midwifery staff and the domiciliary midwives were given a full explanation of the study. Regular progress reports were given by the researcher to the staff in the postnatal wards and at the monthly General Nurse's Meeting.

The women eligible to be included in the study were approached by the researcher either in the delivery ward following the birth or on their first postpartum day. All potential participants were given the explanation that the study involved research into their experience of pain and possible problems through the use of three questionnaires, at three days, six weeks and three months following the birth, and the benefits of the study were explained. The researcher explained that the only inherent risk of the study was embarrassment by the questions related to sex.

Written consent was obtained from the participants in the presence of a witness to ensure that the participants understood the study and weren't made to feel pressured to participate (see Appendix E). Confidentiality of the participants responses to the questionnaires was assured at initial interview and on the covering letters in that only a code number was used to differentiate the questionnaires. All participants were made aware of the numerical coding of their data with the exception of the Demographic/Obstetric Data Questionnaire and they were reassured that it was the only form containing their name and address. Their addresses were checked for the accuracy of their postal address.

The participants were advised that the consent form they retained contained the work and home telephone numbers of the researcher should they wish to make contact regarding any questions. All participants were asked if they would be interested in receiving a summary of the results of the study. The names and addresses of the women expressing interest were recorded.

Participants were re-visited by the researcher on the third postpartum day and received the first of the series of three questionnaires to complete. A letter of explanation accompanied each of the three coded questionnaires assuring anonymity and confidentiality of the data collected (see Appendices J, K, & L).

Confidentiality was maintained throughout the study with all information, including the demographic/obstetric data, being secured in a locked cabinet and available only to the researcher. A diary, containing the participant's name and corresponding code number, was kept by the researcher separate from the questionnaires. This diary was used for forward planning the mailing dates and registering the returns of the postal questionnaires and was destroyed on the completion of the study. Consent forms were kept in a separate locked filing cabinet in the researcher's office.

Data Analysis

Data from the 824 study group participants and the 101 control group participants were coded as appropriate and

entered directly from the questionnaires into the computer by the researcher. Missing data from Participant Questionnaire 2 and Participant Questionnaire 3 of the 86 study group non-respondents and the seven control group non-respondents were coded and entered into the computer as missing values for all variables.

The Statistical Analysis System (SAS) statistical program was used both for data management and analysis. Univariate analysis showed all variables except birth weight were not normally distributed and logarithmic transformation did not normalize the variables, so the data were analysed using non-parametric methods. The statistical analysis applied to the data were chi-square analysis, Wilcoxon matched-pairs signed-ranks test, Kruskal-Wallis chi-square approximation, and Analysis of Variance with Tukey Studentized Range (HSD) test using the General Linear Models program. The Wilcoxon test was used in place of the originally proposed parametric tests Analysis of Variance and t-test. Another proposed parametric test, ANCOVA, was produced by the General Linear Models program. Significance was set at the 0.05 level for all tests.

The data analysis began with summary statistics of frequency distributions, measures of central tendency, measures of dispersion and univariate plots.

Hypotheses 1 and 2

Hypothesis 1 compared the subgroup of women undergoing vaginal delivery with an intact perineum and the combined subgroups of women sustaining perineal tears or an episiotomy during vaginal delivery with: (a) the incidence, (b) the intensity, and (c) the duration of participants' self-reported pain.

Hypothesis 2 compared the subgroup of women undergoing vaginal delivery with vaginal or first degree tears and the combined subgroups of women sustaining second degree tears or an episiotomy during vaginal delivery with: (a) the incidence, (b) the intensity, and (c) the duration of participants' self-reported pain.

For Hypotheses 1 and 2:

(a) The incidence - data from Questions 6, 7, 8, and 9 in Participant Questionnaire 1 (PQ1), Question 6 in Participant Questionnaire 2 (PQ2), and Questions 4 and 8 in Participant Questionnaire 3 (PQ3) were categorized into nominal measurements and the respective subgroups of women were compared using chi-square analysis.

(b) The intensity - pain intensity was calculated for each participant in the number of millimetres on the visual analogue scale in Questions 1, 2, 3, and 4 in PQ1, Questions 1, 2, 3, 4, 5, and 12 in PQ2, and Question 3 in PQ3. The pain intensity experienced by the two subgroups of women, as outlined in Hypotheses 1 and 2, were compared using the Wilcoxon 2-sample test.

(c) The duration - data from Question 6 in PQ2 and Questions 4 and 8 in PQ3 were categorized into nominal data and chi-square analysis used to analyse the difference between the respective subgroups of women. Questions 12 in PQ2 and 9 in PQ3 were analysed using the Wilcoxon 2-sample test.

Hypothesis 3

The intensity and duration of participants' self-
reported pain was analysed as described above in sections (b)
and (c), respectively, to determine whether there was any
significant difference between the intensity and duration of
pain experienced by the subgroup of women undergoing an
assisted vaginal delivery with episiotomy and that
experienced by the subgroup of women undergoing a spontaneous
vaginal delivery with tearing or episiotomy.

Objectives 1, 2, and 3

Objectives 1, 2, and 3 compared the perineal outcome, in
terms of pain and discomfort:

(1) of women delivered vaginally with episiotomy or perineal
tears with those delivering with an intact perineum,
(2) of women delivered vaginally with episiotomy with those
women sustaining vaginal and perineal tears, and

(3) of women undergoing a spontaneous vaginal delivery with tearing or an episiotomy with those women undergoing an assisted vaginal delivery with episiotomy.

The analyses for the three Objectives were as described for Hypotheses 1, 2, and 3.

Objective 4

To identify the short and long-term effects of episiotomy and/or perineal tears. The REEDA scale, completed by the midwife observer in PQ1, was used to measure the short-term effects (Day 3) of bruising, oedema, infection, and primary wound breakdown. The three subgroups of women sustaining episiotomy, first or second degree perineal tears were compared on these measurements using chi-square analysis and Odds Ratio for the relative risk of each subgroup.

The effects of episiotomy and/or perineal tears such as secondary infection, delayed healing, wound breakdown, and the need for re-suturing at six weeks (identified in Questions 7, 8, 9, and 10 in PQ2) were analysed, for the three subgroups of women, using chi-square analysis and Odds

Ratios for the prevalence in women with episiotomy versus
tears and second degree tears versus first degree tears.

The long-term (three month) effects of infection, delayed
healing, wound breakdown, need for re-suturing, perineal pain
when touched or performing various bodily functions, urinary
incontinence, and dyspareunia were identified in Questions 2,
4, 5, and 8 in PQ3. These effects were analysed, for the
three subgroups of women, using chi-square analysis and Odds
Ratios as above.

Objectives 5 and 6

To identify the relationship between the intensity and
duration of perineal pain and the different suturing methods
and suturing materials. The intensity and duration of
perineal pain were analysed as described for Hypotheses 1, 2,
and 3. Participants were assigned to subgroups according to:
(a) the type of perineal trauma sustained (Question 6,
Demographic/Obstetric Data Questionnaire [D/ODQ]),
(b) the four different suturing methods used (Questions 10
and 11, D/ODQ), and

(c) the different suturing materials used (Question 12, D/ODQ).

Intensity - Wilcoxon 2-sample tests were carried out for each subgroup of women to determine:

(a) the effects of the two independent variables, the type of trauma and the methods of suturing used, on the intensity of perineal pain, and the interaction between these two variables.

(b) the effects of the two independent variables, the type of trauma and the suturing material used, on the intensity of perineal pain, and the interaction between these two variables.

Duration - Chi-square analysis and Wilcoxon 2-Sample tests were used to determine the relationship between the duration of perineal pain experienced by each subgroup of women and the different types of suturing methods and suturing materials used, at 3 days, 6 weeks, and at 3 months.

Objective 7

To identify the relationship between the type of
anaesthesia used for perineal suturing and the intensity of
short-term (Day 3) perineal pain. The three perineal trauma
subgroups of participants were assigned to one of two
subgroups according to the type of anaesthesia used for
perineal suturing (Question 16, D/ODQ). Scores for the
intensity of short-term pain were calculated, in millimetres,
on the visual analogue scale Questions in PQ1 (Questions 2,
3, and 4) for the three perineal trauma subgroups. Wilcoxon
2-sample tests were used to measure the differences in pain
scores between the two anaesthesia subgroups. Chi-square
analysis was used to determine the differences between the
incidenc ͻ   ɿin (Questions 6 and 7 in PQ1) experienced by
the three ρ   ˥ trauma subgroups and the two types of
anaesthesia used for suturing.

Objective 8

To identify the relationship between the weight of the
newborn at birth and the degree of perineal trauma. The

effect of birthweight (Question 4, D/ODQ) on the incidence, type or degree of perineal trauma (Question 6, D/ODQ) was analysed using Analysis of Variance with Tukey Studentized Range test using the General Linear Models program. Within each intact or perineal trauma subgroup Analysis of Variance was used to test whether the birthweights were different between multiparous and nulliparous participants.

Objective 9

To determine if a history of dyspareunia has any relationship with the degree of perineal trauma and the intensity and duration of dyspareunia following childbirth.

The variables, pain with intercourse at six weeks (Question 12, PQ2), pain with intercourse at three months (Question 8, PQ3), and the duration in weeks after delivery until sexual intercourse became comfortable (Question 9, PQ3), were not normally distributed as a large proportion of the respondents answered these questions with 0. Logarithmic transformation did not solve the problem so the data were treated as ordinal non-parametric variables.

Differences between two groups were measured with the Wilcoxon 2-sample test and differences among groups with Kruskal-Wallis Chi-square approximation. Median and interquartile ranges have been used to describe the distribution of these variables. Analysis of Variance with Tukey Studentized Range (HSD) test using the General Linear Models procedure was used to determine the effect that a history of dyspareunia had on the intercourse pain variables.

Methodological Limitations

The generalizability of this study is limited in the following:

1. All data were collected from participants delivering in one hospital.

2. A convenience sample of women was used.

3. All women not fluent in English were excluded from the study.

4. The results of the study are based on a sample of participants who chose to reply to the questionnaires. Those participants may have had especially strong opinions and/or

had a particularly bad experience with their episiotomy or perineal tear.

5.   Inter-rater reliability was not established between midwives using the REEDA scale to assess the participants' perineum.

Chapter 5

Results

The study findings are presented in relation to the objectives identified in chapter one, and are thus organised under the following headings: sample characteristics, the effect of perineal integrity on pain, the effect of the degree of perineal trauma on pain, the effect of mode of vaginal delivery with perineal trauma on pain, the short and long-term effects of perineal trauma, the relationship between perineal suturing methods and pain experience, a comparison of chromic catgut and vicryl and their effect on perineal pain, the relationship between short term pain and suturing anaesthesia, the effect of birthweight on the degree of perineal trauma, resumption of intercourse and dyspareunia, and participant's sensory, affective and evaluative word pain descriptors.

The Study Sample

The four subgroups of participants for comparison in this study were: a group of 101 women who delivered vaginally without sustaining any perineal trauma, a group who sustained only minor trauma in the form of a first degree perineal tear or vaginal or labial lacerations (n = 181), a group who sustained major trauma in the form of a second degree perineal tear (n = 199), and women who underwent an episiotomy and/or sustained a third degree perineal tear (n = 444). The first subgroup was recruited to represent a control group of women, whilst the latter three subgroups formed the study group.

A total of 925 participants were recruited to the study, 824 in the study group and 101 in the control group. All participants (N = 925) completed the first participant questionnaire distributed on the third postpartum day. The second and third participant postal questionnaires, dispatched to the 925 participants for completion at six weeks and three months postpartum, were completed by 832 participants (n = 738 study group and n = 94 control group).

Of the non-respondent study group ($\underline{n}$ = 86), 49 had sustained an episiotomy, 14 a second degree tear, and 23 a first degree tear.

Sample Characteristics

Data for the sample characteristics were obtained from the Demographic/Obstetric Data Questionnaire completed following each delivery by the attending midwife and/or medical staff carrying out the perineal repair. The demographic and obstetric data are summarized in Tables 2 to 6.

Age.

Ages ranged from 14 years to 43 years with a mean age of 27.5 years ($\underline{SD}$ = 6.0) and a mode of 31 years. One hundred and three participants (11.1%) were aged between 14 and 19 years, 144 (15.6%) were aged between 20 and 24 years, 30º (33.4%) were aged between 25 and 29 years, 213 (23.0%) were aged between 30 and 34 years, and another 156 (16.9%) were between 35 and 43 years of age.

Table 2

Frequency Distribution for Age Groups

Age Group in Years	$\underline{n}$	%
14 - 19	103	11.1
20 - 24	144	15.6
25 - 29	309	33.4
30 - 34	213	23.0
35 - 43	156	16.9
Total	925	100.0

Race.

The racial groups represented in the study were 754 Caucasian (81.5%), 118 Asian (12.8%), 43 Aboriginal (4.6%) and 10 'Other', which included Polynesian and South American Indians (1.1%).

Payment for Hospital Service.

The study sample included 22.9% private patients
($\underline{n}$ = 212) covered for hospital expenses by Private Health
Insurance premiums and 77.1% public patients ($\underline{n}$ = 713)
covered for hospital expenses under the Government's Medicare
System.

Parity.

More than one half (52.6%) of the women in the study were
primiparae ($\underline{n}$ = 487), whilst 281 women (30.4%) already had
one child and the remaining 157 women (17%) had between two
or six children (see Table 3). Three hundred and sixty nine
(84.2%) of the multiparous women reported that they had
experienced an episiotomy or perineal tear with at least one
previous birth.

For the purpose of this study the primiparous
participants have been designated as parity 0 to avoid
confusion, although it is recognized that following the birth
they actually become a parity 1.

Table 3

Frequency Distribution for Parity

Parity	$\underline{n}$	%
0	487	52.6
1	281	30.5
2	106	11.5
3	38	4.1
4	11	1.2
5	1	0.1
6	1	0.1
Total	925	100.0

The researcher had not anticipated a difference in general in pain levels between the primiparous and multiparous women "a-priori", but rather, that differences would be related to the subgroups designated according to the degree of perineal trauma. The participants were stratified into two groups by parity (primipara and multipara) to test for variance between the groups and the data were analysed by applying a chi-square test to perineal outcome; that is, intact, first degree tear, second degree tear, or episiotomy.

The results indicated that there was a significant difference between parity and perineal outcome $X^2(3, \underline{N} = 925) = 47.235$, $\underline{p} < .000$. The episiotomy rate differed considerably in the two groups; 30.4% of the primiparas had an episiotomy compared with 17.6% of the multiparas and, as anticipated, there were more intact perinea among those women in the multiparous group. The findings, summarized in Table 4, include the numbers of third degree tears sustained by each parity group.

Table 4

Subgroup of Perineal Outcome by Parity Frequency

	Parity ($\underline{N}$ =925)					
	Multiparous			Primiparous		
Subgroup	$\underline{n}$	%	3°	$\underline{n}$	%	3°
Episiotomy	163	17.6	5	281	30.4	23
Intact	70	7.6		31	3.3	
1st Degree Tear	93	10.1		88	9.5	
2nd Degree Tear	112	12.1		87	9.4	
Total	438	47.4	5	487	52.6	23

X^2 (3, $\underline{N}$ = 925) = 47.235, $\underline{p}$ <.000

Despite the differences in the patterns and degrees of trauma sustained by the two parity groups at delivery, the frequency of conditions precipitating pain reported by the two groups, were very similar at both three days and three months. Significant differences were observed, however, for the higher percentage of primiparous women who reported persistent pain (p <.004) and the lower percentage of multiparous women who reported no pain (p <.001) at three days. Similarly, significantly more multiparous women did not require pain relief at six weeks (p <.0000) and reported no pain at three months (p <.007). These differences were partly explained by the different proportions of women with intact perinea and episiotomy in the two parity groups. Therefore, the remaining data analyses, except for birthweight and incontinence, were carried out without stratifying the primiparous and multiparous participants into two parity groups.

Labour Characteristics.

Table 5 summarizes the minimum, maximum and mean measures for the duration of the first and second stages of labour, blood loss at delivery and infant birthweight

Table 5

Minimum, Maximum, Means and Standard Deviations for Labour
Duration, Blood Loss and Birthweight

Characteristics	Min	Max	$\overline{X}$	SD
First stage (hrs)	0.25	33.41	5.85	4.02
Second stage (hrs)	0.01	7.91	1.04	1.02
Blood loss (mls)	50	4000	346.42	311.93
Birth weight (g)	1025	5185	3297.93	563.14

Analgesia During Labour.

Almost all the participants required analgesia during labour: 394 (42.6%) received an epidural, 218 (23.6%) received Pethidine, 180 (19.4%) used Nitrous Oxide and Oxygen gas, and 9 (1%) were administered the Transelectrical Nerve Stimulator (T.E.N.S.). One hundred and twenty four (13.4%) participants required no pain relief during labour.

Mode of Delivery.

Participants gave birth by one of four modes: 668 (72.2%) had a spontaneous vaginal delivery, 131 (14.2%) were delivered with the aid of forceps, 105 (11.4%) by vacuum extraction, and 21 (2.3%) had a breech birth.

Type of Perineal Trauma.

More than one half (53.64%) of the participants in the study group received an episiotomy during delivery ($\underline{n}$ = 442). For 26 of these women the episiotomy extended to a third degree tear; 12 occurred during spontaneous vaginal births, 7 with forceps, and 7 with vacuum extractions. A further two participants (0.24%) who sustained a third degree tear without episiotomy, one with a forceps delivery and one with a vacuum extraction, were included in the episiotomy subgroup for the purpose of the analyses ($\underline{n}$ = 444). The overall third degree tear rate was 3.40% ($\underline{n}$ = 824). The majority (97.06%) of episiotomies performed were mediolateral.

One hundred and ninety nine participants (24.15%) sustained a second degree perineal tear and 181 participants (21.97%) sustained either a first degree perineal tear (n = 100), a vaginal wall tear (n = 57) or a labial tear that required suturing (n = 24). The first degree tears, vaginal wall tears and labial tears were defined as a first degree tear for the purpose of analysis.

Overall Perineal Outcome.

During the six month study period the overall episiotomy rate for the hospital was 31.79%, whilst second degree tears accounted for 15.26%, and first degree tears 13.03%, of all vaginal births (N = 1573). Each overall rate being approximately 40% less than the respective study sample rates.

Reasons for Performing an Episiotomy.

The reasons the 444 episiotomies were performed are summarized in Table 6. The two non-episiotomy third degree

tears are included because they occurred during instrumental deliveries.

Table 6

Reasons for Performing Episiotomies (N = 444)

Reason	n	%
Fetal distress	122	27.5
Instrumental delivery	91	20.5
Imminent tearing	71	16.0
Tight/rigid perineum	47	10.6
Preterm birth	26	5.9
Prolonged second stage	20	4.5
To shorten second stage	18	4.1
Large baby	14	3.2
Maternal medical condition	9	2.0
Breech birth	8	1.8
Maternal request	5	1.1
Previous episiotomy	4	0.9
Malposition	3	0.7
Previous third degree tear	3	0.7
Cord presentation	1	0.2
Primipara	1	0.2
Previous perineal cosmetic surgery	1	0.2
Total	44	100.0

The Effect of Perineal Integrity on Pain

Hypothesis 1

The chi-square test and the Wilcoxon 2-sample test were used to examine the responses of the respondents to items in the three participant questionnaires to compare the incidence, intensity and duration of self-reported perineal pain between the subgroup of women with an intact perineum ($\underline{n}$ = 101) and the three combined subgroups of women with perineal trauma from an episiotomy, second degree tear or first degree tear ($\underline{n}$ = 824). The Hypothesis stated that the intact subgroup would report significantly less pain than the trauma subgroup.

Incidence - Day 3.

On one item participants were asked if the perineal pain they were experiencing was persistent or present all the time. Only one (1.01%) participant in the intact subgroup responded in the affirmative as compared to 123 (15.04%) in the trauma subgroup ($\underline{p}$ <.0000). In response to

a second item of when the participants experienced pain if it wasn't persistent, 51 (51%) of the intact subgroup reported no pain. This was significantly different to the 45 (6.38%) women in the trauma subgroup who reported no pain (p <.0000). The measures for part-time, pain inducing activities and p values for Fisher's Exact test for the difference in occurrence between each subgroup (intact versus trauma) are shown in Table 7. The five most commonly reported pain inducing activities were: walking, sitting, positioning for breastfeeding, going to stand up and going to the toilet. Positioning for breastfeeding was the only non-significant response (p <.059), although it does show a trend towards significance. The other four activities showed highly significant findings (p <.001 to p <.0000) with the intact subgroup being the most comfortable group (see Table 7).

Analgesic requirements and other pain relieving measures used on day three are tabled in Table 8. No form of pain relief was required by 95.5% of the women in the intact subgroup (n = 101) compared to 63.3% of the women in

Table 7

Conditions Precipitating Pain

	Subgroup				
	Intact ($\underline{N}$ = 101)		Trauma ($\underline{N}$ = 824)		
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
Day 3					
Persistent pain	1	(1.01)	123	(15.04)	.0000
No pain	51	(51.00)	45	(6.38)	.0000
Pain condition					
Walking	13	(12.87)	291	(35.32)	.0000
Sitting	22	(21.78)	400	(48.54)	.0000
Breastfeeding	5	(4.95)	94	(11.41)	.059
Going to stand	9	(8.91)	362	(43.93)	.000
Going to toilet	26	(25.74)	350	(42.48)	.001
Touching peri	2	(1.98)	17	(2.06)	1.000
Repositioning	1	(0.99)	27	(3.28)	.351
Cough/sneeze	2	(1.98)	32	(3.88)	.571
Going to sit	1	(0.99)	18	(2.18)	.711
Standing	0	(0.00)	3	(0.36)	1.000
Pelvic exercise	0	(0.00)	3	(0.36)	1.000
Bending	0	(0.00)	4	(0.49)	1.000
Early morning	1	(0.99)	1	(0.12)	.205
3 Months	$\underline{N}$ = 94		$\underline{N}$ = 738		
No pain	90	(95.74)	572	(77.51)	.00007
Pain condition					
Touching peri	0	(0.00)	56	(7.59)	.011
Sitting	0	(0.00)	25	(3.39)	.135
Voiding	1	(1.06)	10	(1.35)	.805
Defecating	4	(4.25)	42	(5.69)	.702
Walking	0	(0.00)	3	(0.41)	.769
Inserting tampon	0	(0.00)	2	(0.27)	.539
Standing too long	0	(0.00)	2	(0.27)	.539
Intercourse	1	(1.06)	94	(12.74)	.001
Pelvic exercise	0	(0.00)	2	(0.27)	.539

Table 8

Pain Relief in the Intact and Trauma Subgroups

| | Subgroups | | | | |
| | Intact ($\underline{N}$ = 101) | | Trauma ($\underline{N}$ = 824) | | |
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
Day 3					
None	96	(95.05)	522	(63.35)	.0000
Tablets	2	(1.98)	216	(26.21)	.0000
Ice packs	1	(0.99)	84	(10.19)	.0007
Injection	0	(0.00)	3	(0.36)	1.000
Ultrasound	1	(0.99)	93	(11.17)	.0003
Sitz bath	0	(0.00)	9	(1.09)	.608
Air cushion	0	(0.00)	6	(0.73)	1.000
Shower, hot/cold	0	(0.00)	12	(1.46)	.630
Hot packs	1	(0.99)	4	(0.49)	.438
Indocid suppos	0	(0.00)	1	(0.12)	1.000
Six Weeks		$\underline{N}$ = 94		$\underline{N}$ = 738	
None	92	(97.87)	669	(90.65)	.030
Ice packs	0	(0.00)	22	(2.98)	.175
Tablets	2	(2.13)	38	(5.15)	.301
Ultrasound	0	(0.00)	10	(1.35)	.527
Sitz bath	0	(0.00)	11	(1.49)	.476
Elevating legs	0	(0.00)	2	(0.27)	.540
Ray lamp	0	(0.00)	1	(0.13)	.221
Xylocaine cream	0	(0.00)	3	(0.41)	.769

the trauma subgroup ($\underline{n}$ = 824) ($\underline{p}$ <.0000). Of the remaining participants, significant differences were found between the subgroups with the use of analgesic tablets ($\underline{p}$ <.0000), ice packs ($\underline{p}$ <.0007) and ultrasound therapy ($\underline{p}$ <.0003). Overall, the intact subgroup required far less pain relief than the trauma subgroup.

The differences among the responses to "pain experienced while voiding" were also analysed using chi-square. The frequencies for severe pain and inability to pass urine were insufficient for analysis so the categories were collapsed to 'no pain with voiding' and 'pain while voiding'. Fisher's Exact test using 2x2 tables was applied to the data. A highly significant difference was found between the two subgroups with the intact subgroup experiencing no, or far less, pain than the trauma subgroup X^2 (1, $\underline{N}$ = 925) = 7.04, $\underline{p}$ <.007, $\underline{OR}$ = .540.

Incidence and Duration of Pain - 6 Weeks and 3 Months.

The chi-square test was used to examine the differences between the intact subgroup and trauma subgroup with respect to pain relieving methods used by the

participants at six weeks and perineal pain inducing activities at three months. Ninety four women in the intact subgroup and 738 women in the trauma subgroup responded to the questionnaires at six weeks and three months. The 93 non-respondents comprised 7 of the 101 women in the intact subgroup (6.93%) and 86 of the 824 women in the trauma subgroup (10.44%). The rate of drop out was not statistically significant between the two subgroups (Fisher's Exact test p <.233).

No significant differences were found between the two subgroups for participants who still required analgesia or other forms of pain relief at six weeks, although a difference was apparent. Only two participants in the intact subgroup simply required analgesic tablets compared to at least one participant in the trauma subgroup requiring each form of pain relieving methods (see Table 8). The difference between the percentages of participants in the two subgroups (intact 97.87% and trauma 90.65%) who did not require pain relief at all was significant (p <.030).

At three months a significantly greater percentage (95.74%) of the intact subgroup ($\underline{n}$ =94) were without pain, whilst only 78.04% of the trauma subgroup ($\underline{n}$ = 738) were completely comfortable ($\underline{p}$ <.00007). The four most common activities which precipitated the participants to experience perineal pain were: when the perineum was touched ($\underline{p}$ <.011), sexual intercourse ($\underline{p}$ <.001), when sitting ($\underline{p}$ <.135), and when defecating ($\underline{p}$ <.702). The first two activities reached statistical significance. Table 7 shows the responses to specific questions as to the pain experienced when the perineum was touched, sitting, voiding and defecating, along with the respondents 'other' responses.

If the participants had resumed coitus by three months they were asked if sexual intercourse had become comfortable again. Their responses showed a significantly larger percentage (96.63%) of the intact subgroup ($\underline{n}$ =89) found intercourse comfortable compared to 82.60% of the trauma subgroup ($\underline{n}$ = 615). The difference between the two subgroups was statistically significant ($\underline{p}$ <.0002).

Intensity - Day Three, Six Weeks and Three Months.

The Wilcoxon 2-samples test was used to analyse the questions related to pain intensity experienced by the participants on day three, at six weeks and at three months. The responses analysed were data obtained from the participant's visual analogue scale scores. The scores were coded in millimetres.

Highly significant differences (p <.0001) were demonstrated for overall perineal pain, sitting, and walking on day three (n = 101 intact subgroup, n = 819 trauma subgroup) and overall perineal pain, sitting, walking, voiding and defecating at six weeks (n = 94 intact, n = 732 trauma) (see Table 9).

The differences in pain intensity scores between the intact subgroup (n = 81) and trauma subgroup (n = 425) participants who had resumed sexual intercourse by six weeks were analysed to determine the intensity and duration of perineal pain. The results were highly significant (p <.0001) indicating that the intact subgroup had resumed

coitus earlier than the trauma subgroup and were experiencing less pain.

The findings from this aspect of the analysis indicated that the intensity of self-reported pain experienced by the women with an intact perineum was far less than that experienced by the women sustaining trauma during the birth.

Table 9
H1 Intensity of Perineal Pain: Day 3, 6 Weeks and 3 Months

	Group			
Pain Variable	Intact	Trauma		
	$\underline{n}$	$\underline{n}$	$\underline{z}$	$\underline{p}$
Day Three				
Overall peri pain	101	819	-10.742	.0001
Sitting	101	819	-10.646	.0001
Walking	101	819	-10.121	.0001
Six Weeks				
Overall peri pain	94	732	-7.221	.0001
Sitting	94	732	-6.043	.0001
Walking	94	732	-5.734	.0001
Voiding	94	732	-5.971	.0001
Defecating	94	732	-7.101	.0001
Sexual intercourse	81	425	-6.579	.0001
Three Months				
Overall peri pain	94	732	-4.512	.0001

The Duration.

The final step in analysis was related to the duration of perineal pain. The objective was to determine how many weeks following birth sexual intercourse became comfortable and whether significant differences existed between the intact and trauma subgroups.

The data were analysed using the Wilcoxon 2-samples test and, as predicted, the difference between the two subgroups was found to be significant (p <.0001). By three months 91.49% of the women with an intact perineum (n = 86) had comfortably resumed sexual intercourse, which was in contrast to the 68.83% of women (n = 508) who had sustained some degree of perineal trauma.

Hypothesis 1 Conclusion.

This Hypothesis stated that the intact subgroup would report significantly less pain than the combined subgroups of participants who sustained perineal trauma. As predicted, a significantly greater percentage of

participants with an intact perineum did not experience any pain on day three (p <.000), significantly less pain all the time (p <.0000), and significantly less pain with four of the five most commonly reported pain inducing activities (p <.001 to p <.000).

The analgesic requirements were significantly different between the two subgroups, with the majority (95.05%) of the intact group not requiring pain relief at all (p <.000) or significantly less requirement for the four most frequently used methods (p <.0007 to p <.0000).

At six weeks a significant difference existed between the two subgroups in relation to pain relief. A greater majority of the intact subgroup required no pain relief (p <.030) and, although no significant statistical results were found with the usage of pain relieving methods, the intact subgroup were found to use far less.

Significant statistical differences were also found at three months between the two subgroups. A greater percentage (95.74%) of the intact subgroup did not

experience any pain ($\underline{p}$ <.00007), whilst the remaining participants in the intact subgroup reported none or less pain for all of the pain inducing activities, with significant differences being found for two of the most commonly reported activities, touching the perineum ($\underline{p}$ <.010) and sexual intercourse ($\underline{p}$ <.001). Similarly, the intact subgroup resumed sexual intercourse with comfort significantly earlier than the trauma subgroup ($\underline{p}$ <.0002, $\underline{p}$ <.0001). These results lend support to Hypothesis 1.

The Effect of the Degree of Perineal Trauma on Pain

Hypothesis 2

The Hypothesis stated that the incidence, intensity and duration of participant's self-reported pain will be significantly less following vaginal delivery with a vaginal or first degree perineal tear than following vaginal delivery with an episiotomy or second degree tear.

The incidence and duration of the participants' self-reported pain were analysed using the chi-square test and the intensity of pain using the Wilcoxon 2-sample test. Hypothesis 2 compared the pain experienced by the subgroups of participants sustaining either a first degree perineal tear or vaginal wall or labial laceration ($\underline{n}$ = 181) with the pain experienced by the combined subgroups of participants who sustained either a second degree perineal tear or an episiotomy ($\underline{n}$ = 643). For the purpose of reporting the results of the analysis the vaginal, labial, or first degree perineal tear subgroup are referred to as the 'minor' subgroup and the combined subgroups of participants with either a second degree tear or episiotomy are referred to as the 'major' subgroup.

Incidence - Day Three.

In response to the question asking if the perineal pain was present all the time, 5.52% of the minor subgroup ($\underline{n}$ = 181) responded in the affirmative compared to 17.74% of the major subgroup ($\underline{n}$ = 637). The difference between the subgroups was highly significant ($\underline{p}$ <.0000) with the

major subgroup reporting more persistent perineal pain. Differences were also evident between the two subgroups with respect to pain not being felt at all: 11.76% of the minor subgroup ($\underline{n}$ = 170) responded that they had no pain while only 4.76% of the major subgroup ($\underline{n}$ = 535) were pain free ($\underline{p}$ <.001). The measures for part time, pain inducing activities and $\underline{p}$ values for Fisher's Exact test for the differences in occurrence between each subgroup are shown in Table 10. The six most commonly reported pain inducing activities were: walking, sitting, positioning for breastfeeding, going to stand up, going to the toilet, and touching or wiping the perineum. Sitting and touching or wiping the perineum were the only two activities to reach a significant difference ($\underline{p}$ <.05 and $\underline{p}$ <.0001, respectively), although the differences were significant for both subgroups. The minor subgroup indicated more comfort sitting, whilst the major subgroup were more comfortable touching or wiping the perineum (see Table 10).

Table 10

Conditions Precipitating Pain, Minor Versus Major

| | Subgroups | | | | |
| | Minor ($\underline{N}$ = 181) | | Major ($\underline{N}$ = 643) | | |
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
Day 3					
Persistent pain	10	(5.52)	113	(17.74)	.0000
No pain	20	(11.76)	25	(4.67)	.001
Pain Conditions					
Walking·	62	(34.25)	229	(35.61)	.792
Sitting	76	(41.99)	324	(50.39)	.05
Breastfeeding	17	(9.39)	77	(11.98)	.427
Going to stand	78	(43.09)	284	(44.17)	.865
Going to toilet	86	(47.51)	264	(41.06)	.126
Touching perineum	11	(6.08)	6	(0.93)	.0001
Repositioning	5	(2.76)	22	(3.42)	.815
Cough/sneeze	7	(3.87)	25	(3.89)	1.000
Going to sit	4	(2.21)	14	(2.18)	1.000
Standing	0	(0.00)	3	(0.47)	1.000
Sudden movement	1	(0.55)	6	(0.93)	1.000
Bending	2	(1.10)	2	(0.31)	.211
Early morning	1	(0.55)	0	(0.00)	.220
3 Months	$\underline{N}$ = 158		$\underline{N}$ = 580		
No pain	135	(85.44)	437	(75.34)	.010
Pain Conditions					
Touching perineum	9	(5.70)	47	(8.10)	.399
Sitting	3	(1.90)	22	(3.79)	.358
Voiding	1	(0.63)	9	(1.55)	.619
Defecating	5	(3.16)	37	(6.38)	.176
Walking	1	(0.63)	2	(0.34)	.841
Inserting tampon	0	(0.00)	2	(0.34)	.901
Standing too long	0	(0.00)	2	(0.34)	.901
Intercourse	14	(8.86)	80	(13.79)	.130
Pelvic exercise	0	(0.00)	2	(0.34)	.901

No form of pain relief was required by 77.35% of the participants in the minor subgroup ($\underline{n}$ = 181) compared to 59.41% of the participants in the major subgroup ($\underline{n}$ = 643). This was a highly significant difference ($\underline{p}$ <.0000). The remaining participants in the major subgroup needed to use more pain relieving methods than the remaining participants in the minor subgroup. Significant differences were reached for analgesic tablets ($\underline{p}$ <.0003) and ultrasound therapy ($\underline{p}$ <.004). The use of ice packs by the major subgroup showed a trend, but did not reach significance ($\underline{p}$ <.164). The analgesic requirements and the use of other pain relieving measures on day three are shown in Table 11. Overall, the minor subgroup required less pain relief than the major subgroup.

The chi-square test was used again to examine the responses to "pain experienced while voiding" on day three. As was the case with Hypothesis 1, the frequencies for severe pain and inability to pass urine were insufficient for analysis so the categories were collapsed to 'no pain with voiding' and 'pain while voiding'. Fisher's Exact test using 2x2 tables was applied to the data. No

significant differences were found between the minor and major subgroups, X^2 $(1, \underline{N} = 819) = .19$, $\underline{p} < .663$, $\underline{OR} = .916$.

Incidence and Duration of Pain at 6 Weeks and 3 Months.

The chi-square test was used to examine the differences between the minor ($\underline{n} = 158$) and major ($\underline{n} = 580$) subgroups with respect to pain relieving methods required by the participants at six weeks and perineal pain inducing activities at three months.

Although the data revealed trends for pain relief required at six weeks, the differences only reached significance on one measure: the taking of analgesic tablets ($\underline{p} < .022$). There was a significant difference found between the participants in the two subgroups who did not require pain relief at all ($\underline{p} < .004$). The minor subgroup reported less pain and less need for pain relief (see Table 11).

Similarly, at three months there was a significant difference between the participants in the two subgroups

who did not require pain relief at all (p <.010). The data revealed trends towards significance for two pain inducing activities, defecation (p <.176) and sexual intercourse (p <.130). By percentages the minor subgroup experienced less pain and for less pain inducing activities (see Table 10).

On a separate item asking specifically if sexual intercourse was comfortable if it had been resumed by three months, a significant difference was found (p <.042) with the women in the minor subgroup (n = 139) reporting greater comfort than the major subgroup (n = 476).

Intensity - Day Three, Six Weeks and Three Months.

The Wilcoxon 2-samples test was used to analyse the questions related to pain intensity experienced by the participants on day three, at six weeks, and at three months. The test analysed the participants' responses, marked in millimetres, on the visual analogue scale questions.

Table 11

Pain Relief in the Minor and Major Subgroups

| | Subgroups | | | | |
| | Minor ($\underline{N}$ =181) | | Major ($\underline{N}$ = 643) | | |
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
Day 3					
None	140	(77.35)	382	(59.41)	.0000
Tablets	29	(16.02)	187	(29.08)	.0003
Ice packs	13	(7.18)	71	(11.04)	.164
Injection (narcotic)	0	(0.00)	3	(0.47)	1.000
Ultrasound	10	(5.52)	82	(12.75)	.004
Sitz bath	2	(1.10)	7	(1.09)	1.000
Air cushion	0	(0.00)	6	(0.93)	.348
Citravescent	3	(1.66)	6	(0.93)	.420
Cold flannel	0	(0.00)	1	(0.16)	1.000
Showers, hot/cold	1	(0.55)	11	(1.71)	.480
Hot packs	1	(0.55)	3	(0.47)	1.000
Indocid suppos	0	(0.00)	1	(0.16)	1.000
6 Weeks	$\underline{N}$ = 158		$\underline{N}$ = 580		
None	153	(96.83)	516	(88.96)	.004
Ice packs	3	(1.90)	19	(3.27)	.523
Tablets	2	(1.26)	36	(6.21)	.022
Ultrasound	0	(0.00)	11	(1.90)	.169
Sitz bath	0	(0.00)	11	(1.90)	.169
Elevating legs	0	(0.00)	2	(0.34)	.901
Ray lamp	0	(0.00)	1	(0.17)	.485

Although the participants tended to record relatively high mean scores for the pain they experienced whilst being sutured, the difference between the minor subgroup (n = 181) and major subgroup (n = 638) did not reach significance. The data did show a trend for the minor subgroup to report less pain during suturing (p <.182) and significantly less pain with specific activities on day three, at six weeks and three months.

Highly significant differences (p <.0001) were found between the minor subgroup (n = 181) and major subgroup (n = 638) for overall perineal pain, with sitting and with walking on day three. Differences between the minor subgroup (n = 158) and major subgroup (n = 574) remained significant at six weeks and three months for all activities: overall perineal pain at six weeks (p <.0003), sitting (p <.0021), walking (p <.016), voiding (p <.0208), defecating (p <.0059), and overall perineal pain at three months (p <.0048).

One hundred and six participants from the minor subgroup and 319 participants from the major subgroup had

resumed sexual intercourse by six weeks. Differences between the subgroups in their intensity and duration of pain with coitus were highly significant (p <.0006) with the minor subgroup reporting less pain.

The findings related to the intensity of self-reported pain indicated that the women with minor perineal trauma experienced far less pain than that experienced by the women with major perineal trauma. The results are shown in Table 12.

The Duration.

The final analysis carried out was to determine the difference between the minor and major subgroups in relation to the number of weeks that passed before they felt comfortable during sexual intercourse. Wilcoxon 2-samples test was used to analyse the data. The results showed a highly significant difference between the two subgroups (p <.0004).

Table 12

H2 Intensity of Perineal Pain: Day 3, 6 Weeks and 3 Months

		Subgroup	
Variable	Minor	Major	
	$\underline{n}$	$\underline{n}$	$\underline{p}$
Pain being sutured	181	638	.1822
Day Three			
Overall perineal pain	181	638	.0001
Sitting	181	638	.0001
Walking	181	638	.0001
Six Weeks			
Overall perineal pain	158	574	.0003
Sitting	158	574	.0021
Walking	158	574	.0158
Voiding	158	574	.0208
Defecating	158	574	.0059
Sexual intercourse	106	319	.0006
Three Months			
Overall perineal pain	158	574	.0048

By three months 67.95% of the women with minor trauma ($\underline{n}$ = 123) had comfortably resumed sexual intercourse, which was in contrast to the 60.34% of women ($\underline{n}$ = 385) who had sustained major perineal trauma.

Hypothesis 2 Conclusion.

As predicted, a significantly greater percentage of participants with minor perineal trauma did not experience any pain (p <.001) and significantly less persistent pain (p <.0000) on day three. The only pain inducing activity to reach significance for the minor subgroup on day three was with sitting (p <.05). The second significantly different pain inducing activity, touching or wiping the perineum, was in favour of the major subgroup (p <.0001). The remaining activities, except for going to the toilet, were indicative that the minor subgroup experienced less pain. The minor subgroup included women with labial lacerations which are in close proximity to the urethra and were therefore more likely to feel stinging from the urine whilst voiding.

Analgesic requirements were significantly different between the two subgroups, with the majority (77.35%) of the minor subgroup either not requiring pain relief at all (p <.0000) or significantly less requirement for two of the

four most frequently used methods, analgesic tablets
($\underline{p}$ <.0003) and ultrasound therapy ($\underline{p}$ <.004).

At six weeks a difference was observed between the two
subgroups in relation to pain relief. Significantly more
women in the minor subgroup required no pain relief ($\underline{p}$
<.004) and significantly less women in the minor subgroup
required analgesic tablets ($\underline{p}$ <.008). Although no other
significant statistical results were found with the
requirement or usage of pain relieving methods the minor
subgroup was noted to have used such methods far less
frequently.

At three months, significantly more women in the minor
subgroup required no pain relief ($\underline{p}$ <.010). Other
differences to reach significance between the two subgroups
at three months were with sexual intercourse. The minor
subgroup resumed sexual intercourse with comfort
significantly earlier than the major subgroup ($\underline{p}$ <.042,
$\underline{p}$ <.0004). The non-significant findings were in favour of
the minor subgroup. Therefore Hypothesis 2 is supported.

The Effect of Mode of Vaginal Delivery With Trauma on Pain

Hypothesis 3

The Wilcoxon 2-samples test and chi-square test were used to examine the data to test Hypothesis 3. The Hypothesis stated that the participants undergoing an assisted vaginal delivery with episiotomy would experience a significantly greater intensity and duration of perineal pain than participants undergoing a spontaneous vaginal delivery with tearing or episiotomy.

Responses to items in the three participant questionnaires were used to compare the intensity and duration of self-reported perineal pain between the subgroups of women who had undergone an assisted delivery (forceps, vacuum extraction, or breech) with an episiotomy (n = 189) and the subgroup of women who delivered spontaneously with either tearing or an episiotomy (n = 573). Subgroups will be referred to as 'assisted' and 'spontaneous'.

Intensity - Day Three, Six Weeks and Three Months.

The Wilcoxon 2-samples test was used to analyse the data obtained from the participant's visual analogue scale scores to determine pain intensity over the three time periods (three days, six weeks and three months).

For the first question of the questionnaire, participants were asked to record how painful the suturing of their perineum was. When the researcher gave each participant verbal instruction on how to use the visual analogue scale she clarified with each woman that this question did not include the examination of the perineal trauma prior to suturing or the infiltration of local anaesthetic. It is accepted, though unfortunately unavoidable, that these specific interventions would be painful. Therefore, the participants' responses for question one are assumed to reflect the degree of pain the suturing alone caused. The difference between the assisted subgroup (n = 188) and spontaneous subgroup (n = 568) for the suturing question was highly significant (p <.0001) with the assisted subgroup reporting less pain. Further

analysis was undertaken, using the Wilcoxon 2-samples test, to identify the number of participants belonging to each subgroup who had been sutured under epidural analgesia or general anaesthesia rather than local anaesthesia. When the subgroups were re-examined suturing differences were observed. The majority (78.19%) of the assisted subgroup ($\underline{n}$ = 188) were sutured under epidural or general anaesthesia, whilst the majority (84.53%) of the spontaneous subgroup ($\underline{n}$ = 569) were sutured under local anaesthetic. The difference was highly significant ($\underline{p}$ <.0001) and helps to explain why the assisted subgroup experienced less pain during suturing. Both analyses are shown in Table 13.

Highly significant differences ($\underline{p}$ <.0001) were found with overall perineal pain, sitting, and walking on day three ($\underline{n}$ = 188 assisted, $\underline{n}$ = 569 spontaneous). The assisted subgroup reported more pain for these activities even when the second analysis was undertaken. Differences in the second analysis remained highly significant for overall perineal pain ($\underline{p}$ <.0001), walking ($\underline{p}$ <.0001) and sitting ($\underline{p}$ <.0002). These secondary findings suggest that

women sutured under epidural analgesia or general anaesthesia experience a greater intensity of short term perineal pain (see Table 13).

Participants having undergone an assisted delivery with episiotomy ($\underline{n}$ = 171) were involved with more pain than the women who had spontaneous deliveries ($\underline{n}$ = 501) at both six weeks and three months. Significant differences were found for overall perineal pain ($\underline{p}$ <.0007), sitting ($\underline{p}$ <.009), walking ($\underline{p}$ <.005), and voiding ($\underline{p}$ <.018) at six weeks, and for overall perineal pain at three months ($\underline{p}$ <.024). The assisted subgroup showed a trend toward having more pain while defecating at six weeks, but this did not reach significance ($\underline{p}$ <.180).

The secondary analysis carried out between the smaller assisted subgroup with epidural only for the suturing ($\underline{n}$ = 135) and the smaller spontaneous subgroup with only local anaesthetic used for suturing ($\underline{n}$ = 426) showed that, by six weeks and three months, the significant differences found in the primary analysis had diminished. Only one variable,

Table 13

<u>H3 Intensity of Perineal Pain: Day 3, 6 Weeks and 3 Months</u>

Pain Variable	First Analysis Assist	Spont		Second Analysis Assist	Spont	
	$\underline{n}$	$\underline{n}$	$\underline{p}$	$\underline{n}$	$\underline{n}$	$\underline{p}$
Being sutured	188	569	.0001	147	481	.0001
<u>Day three</u>						
Overall perineal	188	569	.0001	147	481	.0001
Sitting	188	569	.0001	147	481	.0002
Walking	188	569	.0001	147	481	.0001
<u>Six Weeks</u>						
Overall perineal	171	501	.0007	135	426	.029
Sitting	171	501	.0092	135	426	.181
Walking	171	501	.0049	135	426	.151
Voiding	171	501	.0183	135	426	.506
Defecating	171	501	.180	135	426	.428
Sexual Intercourse	95	303	.361	77	255	.352
<u>Three Months</u>						
Overall perineal	171	501	.024	135	255	.507

overall perineal pain at six weeks remained significant (p <.029). Sitting (p <.181) and walking (p <.151) showed a trend towards significance, but the remaining activities were not significant, although by mean scores the assisted subgroup still reported slightly more pain than the spontaneous subgroup. This finding supports the observation made of more intense short term pain for patients sutured under epidural or general anaesthetic.

Differences in pain intensity scores between the assisted subgroup (n = 95) and the spontaneous subgroup (n = 303) participants who had resumed sexual intercourse by six weeks were analysed to determine the intensity and duration of perineal pain. Differences between subgroups did not reach statistical significance even with the secondary analysis, although the mean scores indicated the assisted subgroup experienced slightly more pain (see Table 13).

Duration of Perineal Pain - Six Weeks and Three Months

As an indicator of the duration of perineal pain
experienced by the participants the chi-square test was
used to analyse the data with regard to the requirement
for, or use of, pain relieving methods and perineal pain
inducing activities at three months.   Summaries of the
results are shown in Tables 14 and 15.

Similar percentages of participants from each subgroup
did not require pain relief at six weeks.   Differences
between subgroups did not reach significance.   Likewise, no
significant differences or trends were shown between the
subgroups for participants who still required analgesia or
other forms of pain relief at six weeks.   The assisted
subgroup ($\underline{n}$ = 172) tended to use slightly more of the
alternative methods of pain relief, whilst the spontaneous
subgroup ($\underline{n}$ = 504) used slightly more ice packs and
analgesic tablets (see Table 14).

At three months, a trend towards significance was
noted for the absence of pain ($\underline{p}$ <.098) indicating that

members of the spontaneous subgroup were more comfortable. Although the assisted subgroup percentages were consistently higher only one pain inducing activity (inserting a vaginal tampon) showed a trend towards a statistical difference ($\underline{p}$ <.107) (see Table 15).

No differences were shown between subgroups (assisted $\underline{n}$ = 142, spontaneous $\underline{n}$ = 424) for the participants who had resumed sexual intercourse with comfort. However, a significant difference was found ($\underline{p}$ <.009), using the Wilcoxon 2-samples test, for the number of weeks taken for sexual intercourse to become comfortable. The spontaneous subgroup ($\underline{n}$ = 350) had comfortably resumed sexual intercourse earlier than the assisted subgroup ($\underline{n}$ = 117).

Table 14

Pain Relief For Assisted and Spontaneous Subgroups

| | Subgroup | | | | |
| | Assisted ($\underline{N}$ =172) | | Spontaneous ($\underline{N}$ = 504) | | |
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
None	155	(82.01)	457	(79.75)	.948
Ice packs	3	(1.59)	18	(3.14)	.348
Tablets	8	(4.23)	30	(5.23)	.654
Ultrasound	4	(2.12)	6	(1.05)	.484
Sitz bath	4	(2.12)	6	(1.05)	.484
Elevating legs	1	(0.53)	1	(0.17)	.988
Ray lamp	0	(0.00)	1	(0.17)	.573
Xylocaine cream	1	(0.53)	1	(0.17)	.988

Table 15

Duration of Pain for Assisted and Spontaneous Subgroups

| Pain | Subgroup | | | | |
| | Assisted ($\underline{N}$ =172) | | Spontaneous ($\underline{N}$ = 504) | | |
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
No pain	125	(66.14)	399	(69.63)	.098
Activity					
When touched	16	(8.47)	35	(6.11)	.399
Sitting	8	(4.23)	16	(2.79)	.506
Voiding	2	(1.06)	8	(1.40)	.974
Defecating	14	(7.41)	26	(4.54)	.214
Walking	1	(0.53)	1	(0.17)	.988
Leaning forward	1	(0.53)	0	(0.00)	.573
Inserting tampon	2	(1.06)	0	(0.00)	.107
Standing	1	(0.53)	1	(0.17)	.988
Intercourse	25	(13.22)	63	(10.99)	.580
Pelvic exercise	1	(0.53)	1	(0.17)	.988
Pushing objects	1	(0.53)	0	(0.00)	.573

Hypothesis 3 Conclusion.

Data analysis showed highly significant differences (p <.0001) for the intensity of pain experienced by the two subgroups of women for pain felt during suturing and overall perineal pain, sitting and walking on day three. The assisted subgroup were found to experience more intense pain for these activities with the exception of pain felt during suturing. A second analysis carried out revealed that the majority of the assisted subgroup had been sutured under epidural or general anaesthesia.

At six weeks and three months the assisted subgroup (n = 171) were involved with significantly more pain than the spontaneous subgroup (n = 501) for all pain intensity activities analysed from the visual analogue scores (p <.018 to p <.0007), with the exception of pain experienced during sexual intercourse. The differences for this item did not reach significance, although the mean scores suggested the assisted group were more uncomfortable during coitus.

Duration of perineal pain was assessed by analysing the pain relief requirements at six weeks, pain inducing activities at three months, and the number of weeks before intercourse became comfortable. No items reached statistical significance except for the resumption of comfortable sexual intercourse, but the percentages showed that the assisted subgroup had experienced slightly more pain than the spontaneous subgroups for the majority of items. Therefore, Hypothesis 3 is supported.

Objectives 1, 2, and 3

Objectives 1, 2, and 3, were analysed and reported under Hypotheses 1, 2, and 3.

The Short and Long-Term Effects of Perineal Trauma

Objective 4

This objective sought to identify the short and long-term (three months) physiological and painful effects of episiotomy and/or perineal tears sustained by women during childbirth.

Different strategies were used to identify factors influencing the physiological and painful effects of perineal trauma. In the first instance the participants were grouped according to the type of perineal trauma they sustained. Thus the three subgroups analysed were: episiotomy (n = 444), second degree tear (n = 199), and first degree tear (n = 181). Further analyses, using the chi-square test, were then undertaken on selected items from the three participant questionnaires. The intact subgroup (n = 101) were excluded from most of the analyses for this objective because the questions being analysed were related to problems experienced with the healing of the perineum.

Day Three.

The REEDA scale was used to describe and compare the perineal healing between the three subgroups and relate it to the discomfort or comfort experienced by the participants in each subgroup. The components of the REEDA scale, which measure redness, (o)edema, bruising, discharge, and approximation, were assessed on a 0 to 3 basis and analysed for each subgroup. Only 138 women in the first degree tear subgroup were assessed using the REEDA scale. The remaining 43 women from the subgroup had internal suturing for vaginal wall tears alone.

Although the results did not reach statistical significance for any of the measures, there was a trend towards a significant difference for bruising and approximation. For these two measures, as well as redness and oedema, the first degree tear subgroup were assessed as having the greater percentage of '0'. The episiotomy and second degree subgroups were very similar in their distribution of the 0 to 3 assessment percentages. Table

16 summarizes the percentages for each measure per subgroup.

To relate the REEDA scale assessment to the degree of discomfort the participants reported, the visual analogue scale scores for overall perineal pain were examined using chi-square analysis. The data were analysed for each subgroup to correspond with mild, moderate or severe pain. For the purpose of this study, a 0 to 30 millimetre score on the visual analogue scale was regarded as mild pain, 31 to 70 millimetres as moderate, and 71 to 100 millimetres was regarded as severe pain. The initial analysis, carried out with the intact subgroup included, showed a highly significant difference between subgroups, X^2 (6,$\underline{n}$ = 920)= 57.81, $\underline{p}$ <.000. Because most of this effect was thought to be due to the low pain scores reported by the intact subgroup a second analysis was carried out using chi-square and without the intact subgroup. The exclusion of the intact subgroup, however, did not alter the significant difference between the subgroups, X^2 (4,$\underline{n}$ = 819)= 24.09, $\underline{p}$ <.000).

Table 16

Subgroup Percentages and p Values for the REEDA Scale

Measures/Scale		Episiotomy $\underline{n}$= 444 (%)	Subgroup 2° Tear $\underline{n}$= 199 (%)	1° Tear $\underline{n}$= 138 (%)	$\underline{p}$
Redness	0	62.36	67.01	67.39	
	1	29.25	24.87	26.09	
	2	4.76	7.11	4.35	
	3	3.63	1.02	2.17	.314
Edema	0	69.39	70.56	73.91	
	1	21.54	22.34	21.74	
	2	7.03	6.60	3.62	
	3	2.04	0.51	0.72	.526
Ecchymosis	0	50.34	50.25	60.87	
	1	28.12	28.93	25.36	
	2	9.98	13.71	9.42	
	3	11.56	7.11	4.35	.061
Discharge	0	89.57	88.32	89.13	
	1	8.16	0.72	10.14	
	2	2.04	0.51	0.72	
	3	0.23	0.00	0.00	.535
Approx	0	73.70	73.10	84.78	
	1	25.40	26.40	15.22	
	2	0.91	0.51	0.00	
	3	0.00	0.00	0.00	.071

Those women with episiotomy experienced more pain in the first three days than the tear subgroups. By

percentages, they had reported significantly less mild pain and more moderate and severe pain than the second degree tear and first degree tear subgroups. Conversely, the first degree tear subgroup showed the greatest percentage of mild pain and least moderate pain. The results are illustrated in Figure 4. The initial chi-square test for the intact subgroup is included. The chi-square value and probability for the initial analysis with the intact subgroup was X^2 (6, $\underline{n}$ = 920)= 57.81, $\underline{p}$ <.000.

In this study there appears to be a correspondence between the REEDA scale and the degree of pain the participants in the three perineal trauma subgroups reported.

Six Weeks and Three Months.

The percentages of overall perineal pain were also examined for six weeks and three months by analysing the participants' responses to the visual analogue scores with
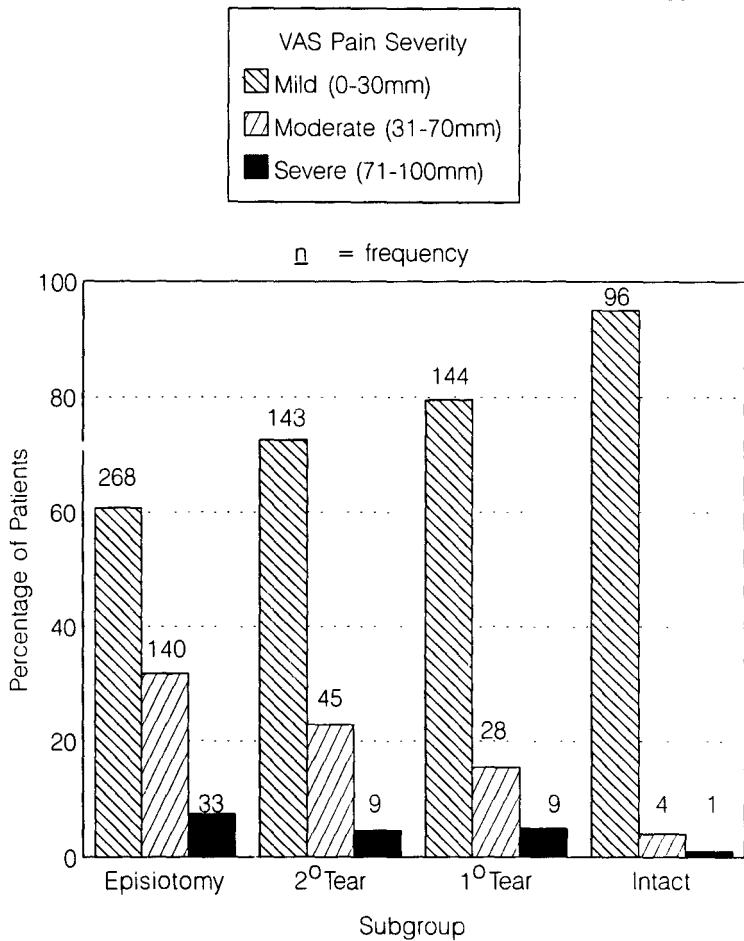
Figure 4. Percentages of Mild, Moderate and Severe Pain at Day 3

the chi-square test. No significant differences were found at the 0.05 level, although the findings at six weeks showed a trend towards statistical significance (p <.054). By percentages, the women with episiotomy (n = 391) reported less mild pain and more moderate pain than the other three subgroups for both time periods. The first and second degree tear subgroups were similar in their distribution of mild, moderate and severe pain responses. The intact subgroup reported only none or mild pain (0 - 30mm on the visual analogue scale). The findings are summarized in Table 17.

Items on the second and third participant questionnaires sought to identify problems the women experienced with the healing of their perineum for which they needed to consult their doctor. The majority of the women from each subgroup responded that they had no problems at both six weeks and three months, viz. episiotomy, 73.87% (six weeks) and 66.22% (three months); second degree tear, 81.40% (six weeks) and 73.87% (three months), and first degree tear, 80.66% (six week) and 77.90% (three months). The predominant problems that were

Table 17

Percentages of Mild, Moderate and Severe Pain Among
Subgroups: Six Weeks and Three Months

		VAS Pain Severity		
Subgroup		Mild (0-30mm)	Mod (31-70mm)	Severe (71-100mm)
Episiotomy				
($\underline{N}$ = 391)				
6 weeks	$\underline{n}$	360	26	5
	(%)	(92.1)	(6.65)	(1.3)
3 months	$\underline{n}$	381	9	0
	(%)	(97.7)	(2.3)	(0.0)
2° Tear				
($\underline{N}$ = 183)				
6 weeks	$\underline{n}$	173	7	3
	(%)	(94.5)	(3.8)	(1.6)
3 months	$\underline{n}$	180	1	2
	(%)	(98.4)	(0.3)	(1.1)
1° Tear				
($\underline{N}$ =158)				
6 weeks	$\underline{n}$	152	6	0
	(%)	(96.2)	(3.8)	(0.0)
3 months	$\underline{n}$	155	2	1
	(%)	(98.1)	(1.3)	(1.6)
Intact				
($\underline{N}$ = 94)				
6 weeks	$\underline{n}$	94	0	0
	(%)	(100.0)	(0.0)	(0.0)
3 months	$\underline{n}$	94	0	0
	(%)	(100.0)	(0.0)	(0.0)

6 weeks X^2 (6, $\underline{n}$ = 826)= 12.38, $\underline{p}$ <.054
3 months X^2 (6, $\underline{n}$ = 826)= 8.42, $\underline{p}$ <.209

reported for both time periods were pain, infection, delayed healing and perineal wound breakdown. Significant differences were reached for pain (p <.004) and delayed healing (p <.009) at three months. These and the other problem variables and percentages per subgroup are summarized in Table 18. A further problem found to be significantly different was 'sutures too tight' at six weeks.

Further comparisons between subgroups were undertaken, for the four predominant problems reported, with odds ratios and 95% confidence intervals. The comparisons made were between episiotomy and first degree tears; second degree tears and first degree tears; and episiotomy and second degree tears. The odds ratios are illustrated in Figures 5, 6 and 7.

The odds ratio comparison between episiotomy and first degree tears indicated that episiotomy was involved with: more pain at both six weeks and three months, 5.24 (1.59, 17.2) and 3.38 (12.58, 7.22) respectively; a significant increase in infection at six weeks and three months, 3.99

Table 18

Perineal Healing Problems and Percentages Per Subgroup: Six

Weeks and Three Months

Problem	Episiotomy ($\underline{n}$ = 395)		Subgroup 2° Tear ($\underline{n}$ = 185)		1° Tear ($\underline{n}$ = 158)		X^2	$\underline{p}$
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{n}$	(%)		
Six Weeks								
Pain	36	9.11	13	7.03	3	1.90	9.07	.102
Infection	28	7.09	10	5.40	3	1.90	5.88	.053
Delay healing	27	6.83	8	4.32	4	2.53	4.57	.102
Wound b/down	18	4.56	5	2.70	3	1.90	2.77	.250
Sutures tight	0	0.00	0	0.00	2	1.26	7.12	.028
Uncosmetic	1	0.25	1	0.54	0	0.00	0.86	.651
Oedema	3	0.76	0	0.00	1	0.63	1.32	.517
Tight scar	3	0.76	0	0.00	0	0.00	2.58	.276
Overhealing	1	0.25	0	0.00	0	0.00	0.86	.652
Irritating stch	1	0.25	2	1.08	1	0.63	1.75	.417
Ununited edges	1	0.25	0	0.00	0	0.00	0.86	.652
Three Months								
Pain	60	15.19	25	13.51	8	5.06	11.05	.004
Infection	30	7.59	12	6.49	5	3.16	3.87	.145
Delay healing	41	10.38	16	8.65	4	2.53	9.41	.009
Wound b/down	23	5.82	10	5.40	3	1.90	4.09	.129
Sutures tight	2	0.51	0	0.00	2	1.26	2.42	.298
Skin tags	3	0.76	0	0.00	0	0.00	2.58	.276
Oedema	3	0.76	0	0.00	2	1.26	1.99	.369
Sutures removed	5	1.26	3	1.62	3	1.90	0.33	.846

(1.20, 13.3) and 2.55 (0.97, 6.68) respectively; and a
trend to have longer delayed healing and wound breakdown at
six weeks, 2.87 (0.99, 8.31) and 2.51 (0.73, 8.62)
respectively. The excessive delayed healing was
significant at three months, 4.50 (1.59, 12.8) and the
increased infection and wound breakdown at three months
approached significance, 2.55 (0.97, 6.68) and 3.24 (0.96,
10.9) respectively (see Figure 5).

The odds ratio comparison between second degree tears
and first degree tears showed that there was significantly
more pain with a second degree tear at both six weeks and
three months, 4.15 (1.16, 14.8) and 3.11 (1.36, 7.08)
respectively; infection 3.14 (0.85, 11.60) and 2.26 (0.78,
6.54) respectively; delayed healing, 1.85 (0.55, 6.26) and
3.14 (0.85, 11.6) respectively, all showed a trend for a
second degree tears to have more, but this did not quite
reach significance (see Figure 6).

The comparison between episiotomy and second degree
tears indicated that there were no significant differences
at six weeks or three months as the 95% Confidence Interval

for the odds ratio included 1 (see Figure 7). The six week and three months odds ratios are displayed for each of the comparison subgroups, in order, in Figures 5, 6, and 7.

Two further items on the second questionnaire sought to identify the percentage of women from each subgroup who were either required to have their perineal sutures removed or have their perineum resutured. Differences between the subgroups did not reach statistical significance for either of the items using the chi-square test (see Table 20). The suturing material used in 26 of the 30 suture removal cases was Vicryl, whilst three of the four women who required re-suturing had been sutured with Vicryl following delivery.

Table 19

Suture Removal and Perineal Resuturing: X^2, Percentages and p Values

Suture Item	Episiotomy		Group 2° Tear		1° Tear		X^2	p
	n	(%)	n	(%)	n	(%)		
Removed	16	(4.09)	6	(3.28)	8	(5.06)	0.69	.709
Resutured	2	(0.51)	1	(0.55)	1	(0.63)	0.03	.985

X^2 (2, n = 732)= 0.69, p<.709; X^2 (2, n = 732)= 0.03, p<.985

Odds Ratios: Episiotomy : 1^O Tear
OR $\pm$ 95% Confidence Interval
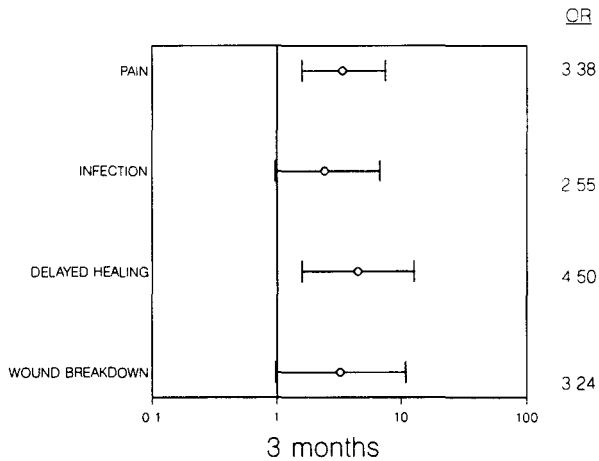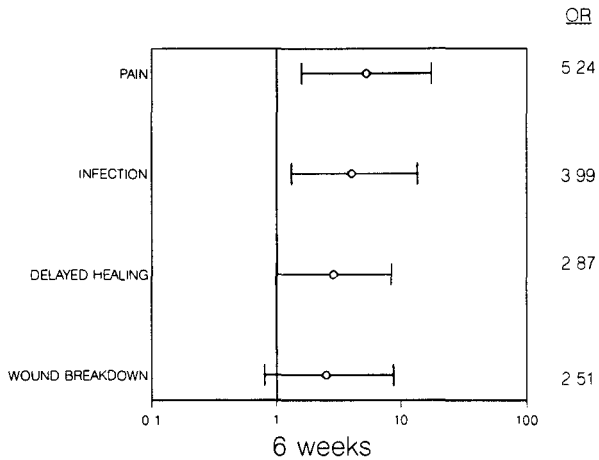
6 weeks

3 months

Figure 5.   Comparison of Episiotomy with 1^O Tear
Six weeks and three months.
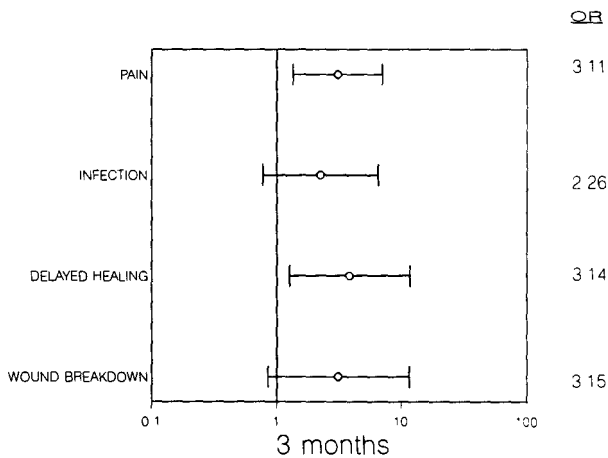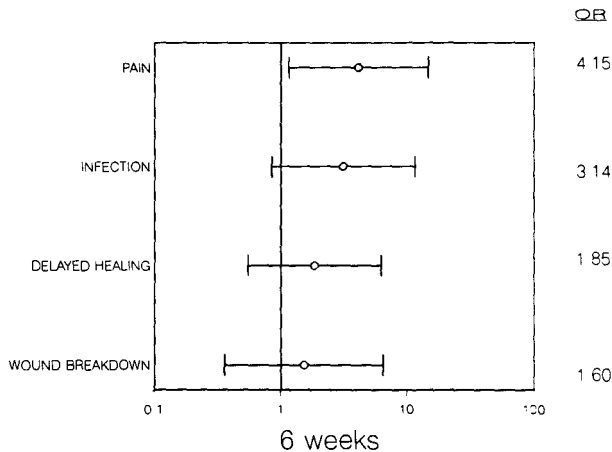
Figure 6. Comparison of 2⁰ Tear with 1⁰ Tear
Six weeks and three months.

Odds Ratios: Episiotomy : 2^O Tear
OR $\pm$ 95% Confidence Interval
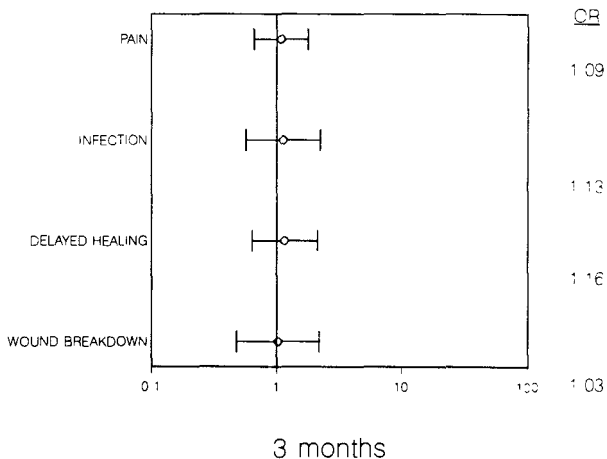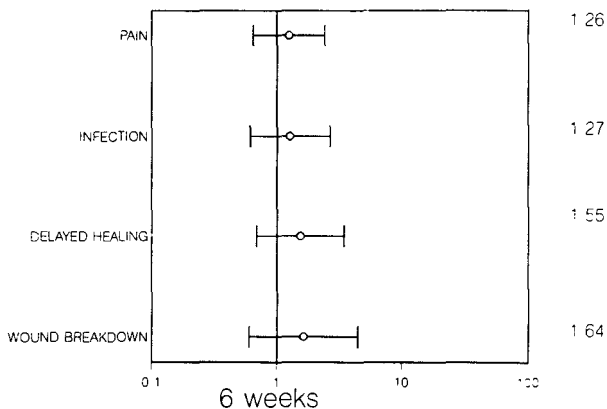
6 weeks

3 months

Figure 7.   Comparison of Episiotomy with 2^O Tear
Six weeks and three months.

Infection.

The relationship between the incidence of infection at both six weeks and three months and the time interval between the birth and the commencement of perineal suturing was analysed using the chi-square test. The three suturing time interval categories were: 0 to 30 minutes, 31 minutes to 1 hour, and greater than 1 hour. The findings were not significant at the 0.05 level for either time period, however, by the percentages of participants who reported infection, the results did indicate that the longer the perineal wound was left unsutured the higher the risk of infection.

The chi-square test was also used to determine the relationship between the number of packets of suturing material that were used and the incidence of infection at both six weeks and three months. The greatest number of suturing material packets used for any individual perineal repair was eight. Highly significant differences (p <.000) were found at both six weeks and three months, although it appeared, by the percentages of participants and the number

of suturing material packets used, to be the same participants reporting the incidence of infection at both time periods. Nevertheless, the results do indicate that the more packets of suturing material that were used ᴜᴏ suture an individual perineal wound the higher the risk of infection, possibly related to the extent of the wound.

Three items on the third questionnaire were selected to elicit the presence of continuing perineal pain and urinary incontinence, and comfort with sexual intercourse. The data, analysed with the chi-square test, showed a significant difference between subgroups for the women who had ceased to experience perineal pain ($\underline{p}$ <.009). Fewer women in the episiotomy subgroup ($\underline{n}$ = 395) reported total comfort. Only one measure for pain inducing activities, sexual intercourse, reached statistical significance ($\underline{p}$ <.013) with the episiotomy subgroup experiencing the most pain. The first degree ($\underline{n}$ = 158) and second degree tear ($\underline{n}$ = 185) subgroups were similar in percentages for this measure. A second measure for the pain inducing activity, touching the perineum, showed a trend for the episiotomy subgroup to experience more pain with touching ($\underline{p}$ <.166)

but the differences between subgroups did not reach statistical significance at the 0.05 level. The pain inducing activities at three months are shown in Table 20.

Table 20

Frequencies and p Values for Pain Inducing Activities

	Subgroup					
	Episiotomy		2° Tear		1° Tear	
Activity	($\underline{N}$ = 395)		($\underline{N}$ = 185)		($\underline{N}$ = 158)	
	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{n}$	(%)	$\underline{p}$
Touching	37	(9.37)	10	(5.40)	9	(5.70)	.166
Sitting	15	(3.80)	7	(3.78)	3	(1.90)	.472
Voiding	6	(1.52)	3	(1.62)	1	(0.63)	.646
Defecating	27	(6.83)	10	(5.40)	5	(3.16)	.231
Walking	2	(0.50)	0	(0.00)	1	(0.63)	.608
Bending/leaning	1	(0.25)	0	(0.00)	0	(0.00)	.652
Insert tampon	2	(0.50)	0	(0.00)	0	(0.00)	.424
Standing	2	(0.50)	0	(0.00)	0	(0.00)	.424
Intercourse	64	(16.20)	16	(8.86)	14	(8.86)	.013
Pelvic exercise	1	(0.25)	1	(0.54)	0	(0.00)	.606

The chi-square test was also used to examine the two items relating to incontinence of urine across the four subgroups; that is, if the participants experienced urinary incontinence and if so, whether or not they needed to wear

a protective pad. Unfortunately, the question of whether
or not the participants suffered from urinary incontinence
prior to the pregnancy was not addressed. A few women did
indicate that stress urinary incontinence was a chronic
problem for them, but there may have been others who failed
to indicate this because it was not included in the
questionnaire.

Although the women in the episiotomy subgroup
experienced incontinence of urine more frequently than the
other three subgroups (see Table 21), the differences
between the subgroups did not reach statistical
significance at the 0.05 level.

Differences between perineal subgroups for the item
regarding wearing a protective pad for incontinence of
urine were also not statistically significant (see Table
21).

When the incidence of incontinence was compared
between parity groups it was shown that similar proportions
of multiparas (27.37%) and primiparas (26.90%) had

experienced incontinence of urine at three months,

X^2 (1, $\underline{N}$ = 826)= .023, $\underline{p}$ <.880. Likewise, similar proportions of multiparas and primiparas either did not need to wear a protective pad (21.03% and 20.69%, respectively), or only sometimes (5.13% and 5.98%, respectively). The five women who reported having to wear a protective pad at all times were multiparas, X^2 (3, $\underline{N}$ = 826)= 5.870, $\underline{p}$ <.118.

Table 21

The Incidence of Urinary Incontinence Between Subgroups

	Subgroups			
	Episiotomy	2° Tear	1° Tear	Intact
Experience of loss of urine	$\underline{N}$ = 391	$\underline{N}$ = 183	$\underline{N}$ = 158	$\underline{N}$ = 94
	$\underline{n}$ (%)	$\underline{n}$ (%)	$\underline{n}$ (%)	$\underline{n}$ (%)
Incontinence	116 (29.67)	45 (24.59)	38 (24.05)	25 (26.60)
Pad required				
Not required	86 (22.05)	37 (20.22)	33 (20.89)	16 (17.02)
Sometimes	27 (6.92)	8 (4.37)	4 (2.53)	7 (7.45)
Always	2 (0.51)	0 (0.00)	1 (0.63)	2 (2.13)

Incontinence X^2 (3, $\underline{N}$ = 826)= 2.64, $\underline{p}$ <.450
Pad Required X^2 (9, $\underline{N}$ = 825)= 11.35, $\underline{p}$ <.252

At three months, the women among the three trauma subgroups who had resumed sexual intercourse were asked if coitus had become comfortable again. Differences were particularly noticeable in participants who had experienced an episiotomy (see Table 22). More participants in this subgroup were still experiencing pain after three months ($\underline{p}$ <.010). Conversely, in a second chi-square analysis which included the intact subgroup, the differences were more marked. Only three women in the intact subgroup had not resumed intercourse at three months with comfort ($\underline{p}$ <.000).

Table 22

Resumption of Sexual Intercourse With Comfort

	Subgroup			
	Episiotomy	2° Tear	1° Tear	Intact
	$\underline{N}$ = 327	$\underline{N}$ = 149	$\underline{N}$ = 139	$\underline{N}$ = 89
	$\underline{n}$ (%)	$\underline{n}$ (%)	$\underline{n}$ (%)	$\underline{n}$ (%)
Painful intercourse	71 (21.71)	20 (13.42)	16 (11.51)	3 (3.37)

X^2 (3, $\underline{N}$ = 704) = 21.66, $\underline{p}$ <.000

The Relationship Between Perineal Suturing Methods and Pain Experience

Objective 5

This objective sought to identify the relationship between the different suturing methods used and the intensity and duration of perineal pain. The results for this objective are presented in two parts, viz. skin sutures and muscle sutures. The first part, skin sutures, compared subcuticular sutures with transcutaneous sutures separately within each trauma subgroup of participants, whilst the second part, muscle sutures, compared continuous muscle sutures with interrupted sutures separately with the episiotomy and second degree tear subgroups. In this study the majority of women were sutured by the subcutaneous skin method and continuous muscle suture method.

The Wilcoxon 2-samples test was used to analyse the participant's responses to the visual analogue scale items over the three time periods for the intensity of pain and the chi-square test was used to analyse selected items for

the duration of perineal pain

Part One : Subcuticular Versus Transcutaneous Skin Sutures

Intensity of Perineal Pain.

Visual analogue scale items on the three participant questionnaires sought to ascertain the difference between the two suturing techniques within each perineal trauma subgroup. Although the analysis showed a trend for the women sutured by the transcutaneous method to experience slightly more pain than the women sutured by the subcutaneous method, the only item to reach a significant difference ($\underline{p}$ <.030) was within the second degree tear subgroup for pain experienced whilst voiding at six weeks.

Duration of Perineal Pain.

Items pertaining to pain relief requirements at six weeks, pain inducing activities at three months, comfort with sexual intercourse and the number of weeks until intercourse became comfortable were analysed for each

subgroup to determine the duration of perineal pain. Only four items reached statistical significance among the three subgroups. On three items, which were with the episiotomy subgroup, the significant differences reached (p <.01) indicating that the women with transcutaneous sutures experienced more pain than the women with subcuticular sutures. Two of the significant items at six weeks were elevating the legs to relieve pressure on the perineum and using xylocaine cream for pain relief at six weeks. The third item to reach statistical significance indicated that the women with transcutaneous sutures found it more painful sitting at three months.

The fourth item to show a significant difference between suturing methods occurred with the second degree tear subgroup. The number of weeks until sexual intercourse was found to be longer with the subcuticular suture group of women (p <.031).

The findings from this aspect of the study are inconclusive, although they do suggest that subcuticular skin sutures may be slightly more comfortable for the

respondents than transcutaneous skin sutures.

Part Two: Continuous Versus Interrupted Muscle Sutures

Intensity of Perineal Pain.

Analysing the responses to the visual analogue scale items on the three participant questionnaires showed that on four items within the episiotomy subgroup and on one item within the second degree tear subgroup the differences reached statistical significance. The four within episiotomy subgroup items were: overall perineal pain at six weeks (p <.035), sitting at six weeks (p <.021), walking at six weeks (p <.016), and voiding at six weeks (p <.009). The second degree tear subgroup showed a significant difference for defecation at six weeks (p <.021). All five significant differences indicated that the respondents sutured with interrupted muscle sutures experienced more pain than those sutured with a continuous muscle suture.

Two further items within the episiotomy subgroup,

overall perineal pain on day three (p <.109) and defecation at six weeks (p <.115), showed a trend for interrupted sutures to induce a greater degree of pain.   Likewise, within the second degree tear subgroup, walking on day three (p <.170) showed a trend for interrupted sutures to induce more pain.   The differences between the suturing methods for these three items did not reach statistical significance at the 0.05 level.   On the remaining items differences between the continuous and interrupted suturing methods were not significant.

Duration of Pain.

The responses to items on pain relieving methods at six weeks, pain inducing activities at three months, comfort with sexual intercourse and the number of weeks until intercourse became comfortable showed only one statistically significant difference between continuous and interrupted sutures.   This difference was within the episiotomy subgroup for the pain inducing activity of touching the perineum (p <.034), indicating the women with interrupted muscle sutures experienced more pain.

When the remaining items were examined trends toward significance were observed for: the pain relieving methods of elevating the legs to relieve perineal pressure (p <.135) and the use of xylocaine cream (p <.135) within the episiotomy subgroup, and for voiding (p <.184), defecation (p <.132) and the resumption of comfortable intercourse (p <.134), within the second degree tear subgroup. The five trends observed showed a tendency for interrupted sutures to induce more pain. Differences between the suturing methods, however, did not reach statistical significance at the 0.05 level.

Although not overwhelming, the findings from the comparison of a continuous muscle suture with interrupted muscle sutures do suggest that continuous muscle sutures were less painful to the participants than interrupted sutures.

**A Comparison of Chromic Catgut and Vicryl and Their Effect
on Perineal Pain**

Objective 6

This objective sought to identify the relationship
between two different suturing materials used (Catgut and
Vicryl) and the intensity and duration of perineal pain
within each of the three perineal trauma subgroups.

Three types of suture material were used in this
study: Chromic Catgut ($\underline{n}$ = 112), Vicryl (polyglactide) ($\underline{n}$
= 709), and Dexon (polyglycolide) ($\underline{n}$ = 3), however, because
of the insufficient numbers in the Dexon group, the Dexon
and Vicryl groups were merged, as both sutures have similar
absorption properties, but are manufactured under different
trade names. The merged subgroup comprised 712
participants.

Intensity of Pain.

The Wilcoxon 2-samples test was used to examine the

data from the visual analogue scale items to determine the
intensity of pain reported by the participants over the
three months.

Despite the relatively small catgut sample number the
distribution of catgut sutures were fairly evenly
distributed between the three trauma subgroups, that is,
12.7% of the episiotomy subgroup ($\underline{n}$ = 444), 11.7% of the
second degree tear subgroup ($\underline{n}$ = 199), and 17.1% of the
first degree tear subgroup ($\underline{n}$ = 181) were sutured with
catgut.

The findings showed that the differences between
catgut and vicryl sutures within each perineal trauma
subgroup were not significant. Only one item within the
first degree tear subgroup, sitting on day three, showed a
trend towards statistical significance ($\underline{p}$ <.150) for vicryl
to be slightly more painful. The difference did not reach
significance at the 0.05 level.

Duration of Pain.

The chi-square test was used to examine the responses of the participants, who formed the three perineal trauma subgroups, on the requirement or use of pain relieving methods at six weeks and pain inducing activities at three months.

When the three subgroups were examined some trends toward statistical significance were observed across the three subgroups. Within the episiotomy subgroup more women sutured with catgut responded that they did not require pain relief at six weeks (p <.060), whereas more women sutured with vicryl required analgesic tablets (p <.154). Similarly, within the first degree tear subgroup, more women sutured with catgut did not require pain relief at six weeks (p <.052), or experienced any pain at three months (p <.111). Conversely, within the second degree tear subgroup, the only women to require ultrasound therapy for pain relief at six weeks were sutured with catgut (p <.121) and more women sutured with catgut experienced painful sexual intercourse at three months (p <.109). Differences

within subgroups did not reach statistical significance at the 0.05 level.

Wilcoxon 2-samples test was again used to examine the differences within the perineal trauma subgroups with respect to the degree of pain experienced by the participants if they had resumed sexual intercourse at six weeks and the number of weeks until sexual intercourse became comfortable. Trends toward significance were again observed within two subgroups for the number of weeks until intercourse became comfortable, viz. the episiotomy subgroup (p <.077) and the second degree tear subgroup (p <.102). The findings indicated that the participants sutured with vicryl in the episiotomy subgroup tended to take slightly longer to resume intercourse with comfort, whilst the participants sutured with catgut within the second degree tear subgroup tended to take slightly longer to resume intercourse with comfort.

Although no significant differences between suturing materials were shown at the 0.05 level, several trends towards significance emerged from the analysis. These

trends suggested that the participants sutured with catgut within the episiotomy and first degree tear subgroups were slightly more comfortable in the long term than those participants sutured with vicryl. In contrast, the participants sutured with vicryl in the second degree tear subgroup appeared more comfortable than those sutured with catgut.

The Relationship Between Short Term Pain and Suturing Anaesthesia

Objective 7

This objective sought to identify the relationship between the type of analgesia/anaesthesia used for perineal suturing and the intensity of short-term (three day) perineal pain reported by the three perineal trauma subgroups.

In the study 659 participants (79.97%) were sutured under local anaesthesia (lignocaine 0.5% or 1%) and 148 participants (17.96%) were sutured under epidural

analgesia. Seventeen participants were excluded from the analysis for this objective because of suturing analgesia differences. The 17 included two participants who were sutured without any analgesia and 15 participants who were sutured under general anaesthesia. A further exclusion was made for the participants sutured with chromic catgut (n = 112) because the literature suggests that these women are more likely to experience more intense short-term perineal pain due to the inflammatory response of the catgut to stimulate phagocytosis (Roberts & McKay Hart, 1983). Three of the participants sutured under general anaesthetic and one participant sutured without analgesia were sutured with catgut. Therefore, the final sample number suitable for analysis on this variable was 697.

The distribution of participants sutured under epidural analgesia within the three perineal trauma subgroups were: 21.37% of the episiotomy subgroup (n = 379), 11.05% of the second degree tear subgroup (n = 172), and 14.38% of the first degree tear subgroup (n = 146).

The Wilcoxon 2-samples test was used to determine the

intensity of the participant's perineal pain, as assessed
by the visual analogue scores, within each perineal trauma
subgroup.   The items included: overall perineal pain, and
pain experienced by sitting and walking.   Significantly
higher mean pain scores were shown for the women sutured
under epidural analgesia, but only within the episiotomy
subgroup, for the three items: overall perineal pain
(p <.002), sitting (p <.047), and walking (p <.001).
Although not significantly different, the mean pain scores
within the other perineal subgroups were consistently
higher for the women sutured under epidural.

The chi-square test was used to examine the two items,
"was the pain present all the time" and the pain inducing
activities if pain occurred only part of the time.   On the
first item, if the pain was present all the time, the
differences within the episiotomy and second degree tear
subgroups reached statistical significance (p <.025 and p
<.031 respectively), showing that more participants sutured
under epidural analgesia reported persistent perineal pain.
The one remaining item to reach a significant difference (p
<.002) was within the episiotomy subgroup for the pain

inducing activity of going to sit down. This difference
also showed that the participants sutured under epidural
experienced more pain. The findings are summarized in
Table 23.

Items among the three subgroups to show a trend toward
statistical significance included the pain inducing
activities of sitting for the episiotomy subgroup (p <.103)
with more pain being reported by the lignocaine sutured
women; and sitting (p <.150), going to the toilet (p
<.058), and going to sit down (p <.054) within the first
degree tear subgroup. The activities of sitting and going
to sit down showed a tendency for the epidural group to
report more pain (see Table 23). Differences within the
subgroups did not reach statistical significance at the
0.05 level.

The chi-square test was used to examine the responses
of the participants, within each perineal trauma subgroup,
on the requirement or use of pain relieving methods on day
three. Within the episiotomy subgroup, a significantly
higher proportion of the women sutured under local

Table 23

Suturing Anaesthesia and Short Term Pain: Frequencies, Percentages and p Values

| | Episiotomy | | | | | Subgroup 2⁰ Tear | | | | | 1⁰ Tear | | | | |
| | Epid ($\underline{N}$ = 81) | | Lig ($\underline{N}$ = 298) | | $\underline{p}$ | Epid ($\underline{N}$ = 19) | | Lig ($\underline{N}$ = 153) | | $\underline{p}$ | Epid ($\underline{N}$ = 21) | | Lig ($\underline{N}$ = 125) | | $\underline{p}$ |
	$\underline{n}$	(%)	$\underline{n}$	(%)		$\underline{n}$	(%)	$\underline{n}$	(%)		$\underline{n}$	(%)	$\underline{n}$	(%)	
Persistent pain	23	(28.4)	49	(16.6)	.024	6	(31.6)	18	(11.8)	.031	1	(4.8)	8	(6.4)	1.000
No pain	0	(0.0)	10	(4.0)	.218	2	(14.3)	11	(8.1)	.348	3	(15.0)	10	(8.6)	.407
Walking	31	(38.3)	108	(36.2)	.795	6	(31.6)	52	(34.0)	1.000	10	(47.6)	40	(32.0)	.214
Sitting	34	(42.0)	157	(52.7)	.103	10	(52 6)	71	(46.4)	.634	12	(57.1)	48	(38.4)	.150
B/feeding	9	(11.1)	45	(15.1)	.473	1	(5.3)	12	(7.8)	1.000	3	(14.3)	10	(8.0)	.401
Stand up	43	(53.1)	146	(49.0)	.533	5	(26.3)	54	(35.3)	.609	8	(38.1)	54	(43.2)	.812
Toilet	33	(40.7)	119	(40.0)	.899	8	(42.1)	62	(40.5)	1.000	6	(28.6)	66	(52.8)	.058
Touching	0	(0.0)	3	(1.0)	1.000	0	(0.0)	1	(0.6)	1.000	2	(9.5)	7	(5.6)	.618
Moving	2	(2.5)	13	(4.4)	.747	0	(0.0)	4	(2.6)	1.000	1	(4.8)	4	(3.2)	.545
Coughing	1	(1.2)	14	(4.7)	.209	1	(5.3)	6	(3.9)	.566	1	(4.8)	4	(3.2)	.545
Sit down	7	(8.6)	4	(1.3)	.002	1	(5.3)	2	(1.3)	.298	2	(9.5)	1	(0.8)	.054

anaesthesia (58.05%) required no pain relief at all
compared to only 35.80% of the women sutured under epidural
(p <.0004). For the remaining women who did require
analgesia, significant differences were shown for the
higher percentages of women sutured under epidural who
required analgesic tablets (p <.024), and used sitz baths
for comfort (p <.040). A trend towards significance was
shown for more women sutured under epidural to use hot or
cold showers as a comfort measure (p <.067), although this
was not statistically significant at the 0.05 level.

Within the second degree tear subgroup, the difference
between the two suturing anaesthesia groups showed a trend
towards significance for the percentages of women who did
not require any pain relief. The epidural group were found
to be more likely to require analgesia (p <.170), but this
item did not reach the significant level of 0.05. Two
significant differences between the groups were reached for
the pain relieving measures of using ice packs on the
perineum (p <.018) and ultrasound therapy (p <.022). The
epidural group were shown to utilize these two measures
more.

Only trends towards significance were shown within the first degree tear subgroup. The trends showed a tendency for the epidural group of women to use more analgesic tablets (p <.104), more ultrasound therapy (p <.122) and more hot packs on the perineum (p <.144).

The findings from this aspect of the study indicate that the short-term perineal pain reported by participants sutured under epidural analgesia tends to be more persistent pain than that experienced by the participants sutured under local anaesthesia.

The Effect of Birthweight on the Degree of Perineal Trauma.

Objective 8.

The aim of this objective was to determine if there was a relationship between the weight of the newborn at birth and the degree of perineal trauma.

Analysis of Variance with the Tukey Studentized Range (HSD) test using the General Linear Models Procedure was

used to examine the effect birthweight had on the
incidence, type or degree of perineal trauma.

The results of the Analysis of Variance test showed
that there were highly significant differences in
birthweight means between the four subgroups of
participants ($\underline{F}$ = 6.55, $\underline{N}$ = 925, $\underline{p}$ <.0002), viz. intact,
episiotomy, second degree tear, and first degree tear. The
differences were specifically that the second degree tear
subgroup ($\underline{n}$ = 199) had the largest babies, with a mean
birthweight of 3423 grams (95% CI 3301, 3545), followed, in
order, by the episiotomy subgroup ($\underline{n}$ = 444, $\underline{m}$ = 3298 grams,
CI = 3216, 3380), the first degree tear subgroup ($\underline{n}$ = 181,
$\underline{m}$ = 3250 grams, CI = 3122, 3378), and the intact subgroup
($\underline{n}$ =101, $\underline{m}$ = 3138 grams, CI = 2967, 3309) (see Figure 8).

When the Tukey Studentized Range test was used to
compare the differences between the mean birthweights the
second degree tear subgroup was found to be significantly
higher than the other three subgroups, also the episiotomy
subgroup was significantly higher than the intact subgroup.
The first degree tear subgroup was significantly different
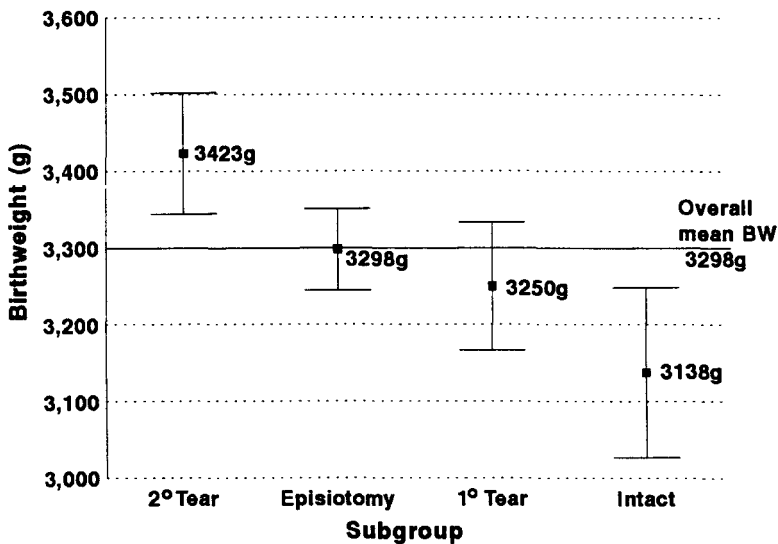
Figure 8. Mean Birthweights for the Four Subgroups Together With Tukey's Simultaneous Confidence Limits.

only from the second degree tear subgroup. Significant
differences were at the 0.05 level. This is demonstrated
in Figure 8, where overlap of the simultaneous confidence
limits denotes no significant difference between subgroups,
and non-overlap denotes that a difference was found to be
significant at the 0.05 level.

Within each intact or perineal trauma subgroup
Analysis of Variance was also used to test whether the
birthweights were different between multiparous and
primiparous participants. The results showed that over the
four subgroups, multiparas had larger babies than the
primiparas. The differences were significantly higher
within the episiotomy (p <.0001), second degree tear (p
<.0007), and first degree tear (p <.003) subgroups. Within
the intact subgroup the difference only showed a trend
toward significance (p <.072) and was not statistically
significant at the 0.05 level. The results are summarized
in Table 24.

Table 24

Mean Birthweights by Parity

	Parity ($\underline{N}$ = 925) Multipara		Primipara				
Subgroup	$\underline{n}$	$\underline{m}$(g)	$\underline{n}$	$\underline{m}$(g)	diff(g)	$\underline{df}$	$\underline{p}$
2nd Degree Tear	112	3524	87	3292	232	1	.0007
Episiotomy	163	3444	281	3213	231	1	.0001
1st Degree Tear	93	3362	88	3130	232	1	.003
Intact	70	3201	31	2994	206	1	.072

Resumption of Sexual Intercourse and Dyspareunia.

Objective 9

This objective was analysed to determine if a history of dyspareunia had any relationship to the degree of perineal trauma and the intensity and duration of dyspareunia following childbirth.

Analyses were undertaken for the overall sample, between perineal subgroups and within perineal subgroups.

Resumption of Sexual Intercourse.

By six weeks postpartum 60.82% ($\underline{N}$ = 832) of the participants had attempted or resumed sexual intercourse. The percentages for each subgroup were: episiotomy, 54.94% ($\underline{n}$ = 395); second degree tear, 55.13% ($\underline{n}$ = 185); first degree tear, 67.09% ($\underline{n}$ = 158), and; intact, 86.17% ($\underline{n}$ = 94). By three months the overall percentage of women who had resumed sexual intercourse was 85.22% ($\underline{N}$ = 832). The percentages for each subgroup were: episiotomy, 82.78% ($\underline{n}$ = 395); second degree tear, 80.54% ($\underline{n}$ = 185); first degree tear, 87.97% ($\underline{n}$ = 158), and; intact 94.70% ($\underline{n}$ = 94). Of the 704 participants who had resumed sexual intercourse by three months, 110 (15.62%) had reported that they were experiencing problems with painful intercourse or dyspareunia.

Differences in Dyspareunia Between the Overall Sample.

For the overall sample of women who responded to the six week and three month questionnaires ($\underline{n}$ = 832) the mean differences, between the group of women who had reported

having dyspareunia prior to the pregnancy (n = 97) and the group who had not experienced any previous dyspareunia (n = 409), were measured using the Wilcoxon 2-samples test. The variables measured were the intensity of pain reported by the participants during sexual intercourse at six weeks and the duration in weeks until sexual intercourse became comfortable. The findings for the Wilcoxon test indicated that the women who reported having dyspareunia prior to the pregnancy (n = 97) had significantly higher values for pain reported for intercourse at six weeks than the women who did not have dyspareunia prior to the pregnancy (n = 409, p <.0001).

Similarly, the women who had resumed sexual intercourse by three months and who had also experienced dyspareunia prior to the pregnancy (n = 115) were shown to take a significantly longer time in weeks before sexual intercourse was reported to have become comfortable than the women without pre-pregnancy dyspareunia (n = 479, p <.0001). The results of both tests are shown in Table 25.

Table 25

Mean Differences for Dyspareunia Between Overall Groups

	Groups				
	Prior Dyspareunia		No Prior Dyspareunia		
Variable	$\underline{n}$	$\underline{m}$	$\underline{n}$	$\underline{m}$	$\underline{p}$
Dyspareunia at six weeks ($\underline{n}$ = 506)	97	346.3	409	231.5	.0001
Weeks until comfortable ($\underline{n}$ = 594)	115	372.5	479	279.5	.0001

Differences Between Perineal Subgroups at Six Weeks.

For the women who had resumed sexual intercourse at six weeks (60.82%) the differences between the four perineal subgroups were measured with the Kruskal-Wallis chi-square approximation. As shown in Table 26 the values for the intensity of pain reported with intercourse at six weeks were highest in the episiotomy subgroup ($\underline{n}$ = 217), then the second degree tear subgroup ($\underline{n}$ = 102), first degree tear subgroup ($\underline{n}$ = 106), and lowest in the intact subgroup ($\underline{n}$ = 81), K-W X^2 (3, $\underline{n}$ = 506) = 55.73, $\underline{p}$ <.0001.

Likewise, at three months the values for the duration

in weeks before intercourse became comfortable were highest
in the episiotomy subgroup ($\underline{n}$ = 256), then the second
degree tear subgroup ($\underline{n}$ = 129), first degree tear subgroup
($\underline{n}$ = 123), and lowest in the intact subgroup ($\underline{n}$ = 86),
K-W X^2 (3, $\underline{n}$ = 594) = 82.19, $\underline{p}$ <.0001.   The results for
both Kruskal-Wallis tests are shown in Table 26.

Table 26

Dyspareunia Differences Between Perineal Subgroups

	Subgroup			
	Epis	2° Tear	1° Tear	Intact			
Variable	$\underline{n}$	$\underline{n}$	$\underline{n}$	$\underline{n}$	K-W X^2	$\underline{df}$	$\underline{p}$
	$\underline{m}$	$\underline{m}$	$\underline{m}$	$\underline{m}$			
Dys-pareunia at 6 wks ($\underline{N}$ = 506)	217 289.3	102 275.7	106 230.8	81 159.2	55.73	3	.0001
Weeks until comfort-able ($\underline{N}$ = 594)	256 350.2	129 306.0	123 274.4	86 160.9	82.19	3	.0001

<u>Participant Dyspareunia Differences Among Perineal Subgroups</u>.

The Kruskal-Wallis chi-square was also used to examine the differences between the four perineal subgroups and the participants within these subgroups who had, or had not, experienced dyspareunia prior to the pregnancy. For the participants who had not experienced dyspareunia before the pregnancy, the Kruskal-Wallis chi-square test was highly significant for the degree of pain they reported with sexual intercourse at six weeks, K-W X^2 (3, $\underline{n}$ = 409) = 52.40, $\underline{P}$ <.0001. The participants in the episiotomy subgroup reported the highest pain, then the second degree tear subgroup, first degree tear subgroup, and lowest in the intact subgroup (refer to Table 27).

Similarly, for the participants who had not experienced dyspareunia before the pregnancy, the Kruskal-Wallis chi-square test was significant (K-W X^2 (3, $\underline{n}$ = 479) = 82.09, $\underline{p}$ <.0001) for the duration in weeks before sexual intercourse became comfortable. As shown in Table 28, the episiotomy subgroup participants reported the highest pain, then the second degree tear subgroup, first degree tear

subgroup, and lowest in the intact subgroup. However, the participants among the four subgroups, who had reported experiencing dyspareunia prior to the pregnancy, showed no difference for the amount of pain reported with sexual intercourse at six weeks, K-W X^2 (3, $\underline{n}$ = 97) = 0.106. $\underline{p}$ <.991 (refer to Table 27), or as shown in Table 28, for the duration in weeks before sexual intercourse became comfortable, K-W X^2 (5, $\underline{n}$ = 115) = 2.904, $\underline{p}$ <.407.

The effect that dyspareunia, prior to the pregnancy, had on the level of pain reported by the participants with sexual intercourse at six weeks and the duration in weeks until sexual intercourse became comfortable was also analysed by the Analysis of Variance with the Tukey Studentized Range (''$^{\frown\Gamma\Gamma}$') test using the General Linear Models Procedure. level of pain reported with intercourse at six weeks, results revealed significant differences within the episiotomy subgroup ($\underline{p}$ <.020), the first degree tear subgroup ($\underline{p}$ <.020), and the intact subgroup ($\underline{p}$ <.014), but not the second degree tear subgroup ($\underline{p}$ <.471) (see Table 27). For the duration in weeks until sexual intercourse became comfortable the results showed

significant differences within the second degree tear subgroup (p <.010), the first degree tear subgroup (p <.0001), and the intact subgroup (p <.047), but not the episiotomy subgroup (p <.376) (see Table 28).

Tables 27 and 28 summarize the results of the Kruskal-Wallis chi-square test and the ANOVA with Tukey Studentized Range test for the significance of the within subgroup differences for those participants who reported having dyspareunia prior to the pregnancy and for those women who did not have dyspareunia previously. Table 27 shows the findings for the level of pain reported by the participants at six weeks, whilst Table 28 shows the findings for the duration in weeks until intercourse became comfortable. The mean, median and interquartile ranges have been included in both tables to describe the distribution of the pain variables.

Table 27

The Incidence of Dyspareunia Among the Perineal Subgroups

at Six Weeks: Prior Dyspareunia Versus No Prior Dyspareunia

	Subgroups						
	Epis	2° Tear	1° Tear	Intact	K-W X^2	$\underline{df}$	$\underline{p}$
Prior Dyspareunia							
$\underline{n}$	49	22	18	8	0.11	3	.991
(%)	(22.6)	(21.6)	(16.9)	(9.9)			
Median	15	19.5	17	17.5			
IQ range	3-36	2-32	2-45	8.5-36.5			
Mean	25.3	19.09	21.83	21.25			
Std Error	3.14	4.68	5.17	7.76			
No Prior Dyspareunia							
$\underline{n}$	168	80	88	73	52.40	3	.0001
(%)	(77.4)	(78.4)	(83.0)	(90.1)			
Median	5	3	0	0			
IQ range	0-25	0-23	0-10	0-0			
Mean	17.0	15.27	8.60	1.11			
Std Error	1.69	2.45	2.34	2.57			
Significance of within subgroup differences							
$\underline{p}$	.020	.471	.020	.014			

Table 28

<u>Weeks Until Sexual Intercourse Comfortable Among the</u>
<u>Perineal Subgroups: Prior Dyspareunia Versus No Prior</u>
<u>Dyspareunia</u>

	Subgroups						
	Epis	2° Tear	1° Tear	Intact			
	$\underline{n}$ = 256	$\underline{n}$ = 129	$\underline{n}$ = 123	$\underline{n}$ = 86	K-W X^2	$\underline{df}$	$\underline{p}$
<u>Prior</u> <u>Dyspareunia</u>							
$\underline{n}$	60	24	23	8	2.90	3	.407
(%)	(23.4)	(18.6)	(18.7)	(9.3)			
Median	8	8.5	8	7.5			
IQ range	7-10	7-10	7-11	6-8.5			
Mean	8.38	8.75	9.04	6.87			
Std Error	0.38	0.60	0.61	1.04			
<u>No Prior</u> <u>Dyspareunia</u>							
$\underline{n}$	196	105	100	78	82.09	3	.0001
(%)	(76.6)	(81.4)	(81.3)	(90.7)			
Median	8	7	6	4			
IQ range	6-10	4-9	4-8	3-6			
Mean	8.00	7.05	6.33	4.70			
Std Error	0.21	0.29	0.29	0.33			
Significance of Within Subgroup Differences							
$\underline{p}$	.376	.047	.0001	.010			

Dyspareunia Differences Within the Four Perineal
Subgroups.

A Wilcoxon two-sample test showed significant
increases within the four perineal subgroups in the
intensity of pain experienced with sexual intercourse at
six weeks by the participants who had reported having
dyspareunia prior to the pregnancy, viz. within the
episiotomy subgroup (p <.0016), second degree tear subgroup
(p <.0113), first degree tear subgroup (p <0002), and
intact subgroup (p <.0001) (see Table 29).

For the variable, the duration in weeks until sexual
intercourse became comfortable, significant increases were
found, with the women who had reported previous
dyspareunia, in the second degree tear subgroup (p <.0147),
first degree tear subgroup (p <.0001), and intact subgroup
(p <.0123), but not in the episiotomy subgroup (p <.2702)
(see Table 29).

<u>Dyspareunia at Three Months Between Perineal</u>
<u>Subgroups</u>.

The chi-square test was used to examine the
participants' reports of pain experienced with sexual
intercourse at three months between the perineal subgroups
and within the perineal subgroups. Between subgroups the
participants who had not experienced dyspareunia prior to
the pregnancy were analysed separately to the participants
who had reported having previous dyspareunia. The findings
were highly significant for the group of women who had not
experienced dyspareunia prior to the pregnancy. Reports of
pain with intercourse at three months were highest in the
episiotomy subgroup (21.3%), then the first degree tear
subgroup (11.5%), second degree tear subgroup (11.0%), and
lowest in the intact subgroup (1.3%),

X^2 (3, $\underline{n}$ = 559) = 22.61, $\underline{p}$ <.000 (see Table 30).

Table 29

The Incidence of Dyspareunia Within Perineal Subgroups at

Six Weeks

Participants with Prior Dyspareunia	Subgroups			
	Epis	2° Tear	1° Tear	Intact
Pain with intercourse at six weeks	($\underline{N}$ = 217)	($\underline{N}$ = 102)	($\underline{N}$ = 106)	($\underline{N}$ = 81)
$\underline{n}$	49	22	18	8
$\underline{z}$ score	3.160	2.534	3.670	5.150
$\underline{p}$	.0016	.0113	.0002	.0001
Weeks until intercourse comfortable	($\underline{N}$ = 256)	($\underline{N}$ = 129)	($\underline{N}$ = 123)	($\underline{N}$ = 86)
$\underline{n}$	60	24	23	8
$\underline{z}$ score	1.102	2.440	3.955	2.504
$\underline{p}$	.2702	.0147	.0001	.0123

Conversely, the finding for the group of women who had reported previous dyspareunia was not significant ($\underline{p}$ <.644). The reports of pain with intercourse at three months were highest in the episiotomy subgroup (23.08%), then the second degree tear subgroup (22.58%), the intact subgroup (20%), and lowest in the first degree tear subgroup (11.54%), X^2 (3, $\underline{n}$ = 145) = 1.67, $\underline{p}$ <.644. The findings are shown in Table 31.

Table 30

The Incidence of Dyspareunia Between Perineal Subgroups at
Three Months

	Subgroups						
	Epis	2° Tear	1° Tear	Intact			
	$\underline{n}$	$\underline{n}$	$\underline{n}$	$\underline{n}$			
	(%)	(%)	(%)	(%)	$\underline{df}$	X^2	$\underline{p}$
No prior							
dyspareunia	53	13	13	1			
($\underline{N}$ = 559)	(21.3)	(11.0)	(11.5)	(1.3)	3	22.61	.000
Previous							
dyspareunia	18	7	3	2			
($\underline{N}$ = 145)	(23.1)	(22.6)	(11.5)	(20.0)	3	1.67	.644

Dyspareunia at Three Months Within Perineal Subgroups

Within the perineal subgroups, the only significant
difference found was in the intact subgroup ($\underline{p}$ <.032) which
indicated that the two women who had reported dyspareunia
prior to the pregnancy also reported more pain at three
months than the participants who had not experienced

dyspareunia previously. The findings for the second degree tear subgroup ($\underline{p}$ <.134) showed a trend towards significance, but the findings for the episiotomy and first degree tear subgroups were not significant. The findings are shown in Table 31.

Table 31

The Incidence of Dyspareunia Within Perineal Subgroups at Three Months

	Subgroups			
	Epis	2° Tear	1° Tear	Intact
	($\underline{N}$ = 327)	($\underline{N}$ = 149)	($\underline{N}$ = 139)	($\underline{N}$ = 89)
	$\underline{n}$	$\underline{n}$	$\underline{n}$	$\underline{n}$
	(%)	(%)	(%)	(%)
Previous				
Dyspareunia	18	7	3	2
	(25.4)	(35.0)	(18.8)	(66.7)
Fisher's $\underline{p}$	.754	.134	1.000	.032

Participant's Sensory, Affective and Evaluative Word Pain Descriptors

In this study the opportunity was taken to question the participants about the words they would use to describe their pain experience on day three and to examine whether the words they spontaneously chose formed categories of the sensory, affective, and evaluative word pain descriptors used in the McGill Pain Questionnaire (M.P.Q.).

As a reflection of the 540 women who completed this question pertaining to a word description of their pain or discomfort on day three an average of two descriptive words were chosen by the women in the episiotomy and second degree tear subgroups and 0.6 words by the women in the first degree tear subgroup. The question was apparently perceived by the majority of the intact subgroup as not being applicable for their level of discomfort, as very few completed the question, or wrote "no pain" or "not too bad".

When the words that were used by the participants were

categorized and compared to the short-form M.P.Q. (Melzack, 1987), the four sensory words selected in the pre-test of the tool featured fairly prominently. These words, and the percentages of women using the words, were: throbbing (1.6%), burning (3.3%), aching (6.5%), and tender (11.1%). Relatively few women selected the remaining seven sensory words and only one of the affective words (fearful, 0.2%) ($\underline{n}$ = 540).

The categories of words were then compared to the standard long-form M.P.Q. (Melzack, 1975).   For the percentage of women selecting particular words ($\underline{n}$ = 540) the fi:.dings showed that, of the 66 words in the M.P.Q. that describe pain quality, a total of only 41 words were selected.   Of these 41 words, 20 only were commonly selected by greater than 1% of the participants.   These 20 words included 13 sensory, 1 affective and 7 evaluative class words.   The highest percentage for any one particular word featured in the M.P.Q. was 16%.   Three words spontaneously chosen by the participants that were not featured in the M.P.Q. classification were the sensory words dragging (0.6%) and bruised (5.4%), and the

evaluative word uncomfortable (23.1%). Table 32 summarizes
the 23 most commonly selected pain word descriptors. The
words are ranked in order of intensity to coincide with the
standard long-form McGill Pain Questionnaire.

It was not the intention of the researcher to
statistically quantify the word descriptors used by the
participants.

Table 32

Percentages of Commonly Selected Word Pain Descriptors

Sensory	%	Affective	%	Evaluative	%
Tender	11.1	Terrifying	1.1	Mild	3.5
Itching	1.6			Bearable	8.1
Dull	2.2			Annoying	5.4
Pricking	2.0			Discomforting	16.0
Sore	8.5			Uncomfortable	23.1 *
Pressing	3.5			Troublesome	1.1
Stinging	8.3			Intense	1.1
Pulling	2.2			Excruciating	1.6
Throbbing	1.6				
Taut	14.4				
Aching	6.5				
Burning	3.3				
Sharp	1.5				
Bruised	5.4 *				

* Words not featured in the standard long-form McGill Pain Questionnaire.

Chapter 6

Discussion and Conclusions

The main purpose of this quasi-experimental study was to examine the relationship between episiotomy, perineal lacerations, and intact perinea and the relative amount of perineal pain experienced by women during childbirth in order to provide a basis for education and for decision-making in the midwives' clinical management of delivery. Further objectives of the study were to identify some of the physiological effects of perineal trauma, and factors such as the relationship between the extent of perineal trauma and the newborn's birthweight, the type of anaesthesia used for suturing, the type of suturing material and technique used for the repair.

The study was conducted in one tertiary care teaching hospital where approximately 4,500 deliveries are conducted each year. During the study the deliveries were performed by those midwives or obstetricians who normally conduct deliveries at the Hospital. No effort was made to

intervene or alter the care the participants received in any way, nor was an attempt made to control for possible confounding factors related to the rate of episiotomy or laceration, such as parity or mode of vaginal delivery.

Limitations of the study include: a convenience sample of participants delivering in the one hospital being surveyed, the exclusion of women not fluent in the English language, and inter-rater reliability for the use of the REEDA scale not being established between midwives.

The following discussion looks at the findings of this study in relation to the literature. A number of conclusions are drawn from the study along with implications for midwifery practice and further research.

Sample Characteristics

Perineal Outcome by Parity Frequency.

The different episiotomy rates between the two parity groups resulted in different patterns of perineal trauma

being sustained by the women in each group at delivery. As anticipated, there were more episiotomies (30.4%) and less intact perinea (3.3%) among the primipara than the multiparous group (17.6% and 7.6%, respectively). However, the multiparas sustained more posterior tears, particularly second degree tears.

In this study, the overall incidence of episiotomy (53.6%) for both parity groups of women was congruent with the 50% incidence reported in other studies (Rockner et al., 1989; Sleep et al., 1984), although the much lower overall rate for the hospital during the study period (31.8%) was comparable to the 28.4% incidence reported by Buekens et al. (1985). It is interesting to note that since the conception of this study the annual episiotomy rate at the participating hospital has shown a steady decline of 2% - 3% per year. The reason for the decline is unclear. Two factors that could be considered are the increase in years of experience of the midwives permanently working in the delivery suite and the growing concern, by these midwives, regarding the sequelae of episiotomy.

<u>Third Degree Tears</u>.

Traditionally, a common tendency has been to assume that an episiotomy should be performed to prevent severe perineal trauma, or third degree tears. However, there are no objective data to support this assumption, and a substantial body of controlled studies suggest that it is invalid (Borgatta et al., 1989; Coats et al., 1980; Isager-Sally et al., 1986; Shiono et al., 1990).

The incidence of third degree tears (3.4%) in this study was higher than anticipated by the researcher. Of the 28 cases, 26 third degree tears were the direct result of an extension of a mediolateral episiotomy. The remaining two cases were spontaneous tears sustained during instrumental deliveries: one forceps and one vacuum extraction. This finding also refutes the argument that episiotomy limits the incidence of third degree tears. None of the 28 third degree tears in this study involved the rectal mucosa.

The observed rate of 3.4% for third degree tears in

this study is difficult to compare with more recent data because of differences in the type of episiotomy, that is, midline or mediolateral. However, compared to studies that have assessed mediolateral episiotomies, the rate found in this study is slightly higher than the 1.4% and 1.8% rates described by Buekens et al. (1985) and Shiono et al. (1990), but lower than the 6% and 9% rates reported, in order, by Harrison et al. (1984) and Coats et al. (1980).

Indications for Performing Episiotomies.

In this study, a wide variation of indications were given for performing an episiotomy. The most frequent indications were for fetal distress, instrumental delivery, imminent tearing and tight/rigid perineum. Although the decision to perform an episiotomy was made by the attending midwife or obstetrician at the time of the delivery it did appear to the researcher, when coding the questionnaires, that many of the reasons given were unjustified. For example, previous episiotomy, primigravid, and shortening second stages that were well within a normal duration.

Hypotheses and Objectives

Pain is a subjective phenomenon. No attempt to assess the participants' pain objectively was made in this study and the following results are based entirely on the women's own subjective assessment of pain.

The Effect of Perineal Integrity on Pain.

The first hypothesis tested in this study was supported. As predicted, significant differences were found to exist between the subgroup of participants with an intact perineum and the combined subgroups of women who had sustained perineal trauma either by episiotomy or perineal tear. A significantly higher percentage of the intact subgroup reported having no pain or less pain at three days, six weeks, and three months following childbirth and significantly less requirement for pain relief at three days and six weeks than the trauma subgroup. It was observed that by three months 91.5% of the women with an intact perineum had comfortably resumed sexual intercourse compared to 68.8% of women who had sustained perineal

trauma.

These findings emerged from a study in which only a relatively small sample of women with intact perinea ($\underline{n}$ = 101) were surveyed. Very few studies have separately reported women with intact perinea in the follow-up, however, the results of this study are in agreement with the research findings of similar short and long-term studies which have (Cater, 1984; Harrison et al., 1980; Kitzinger & Walters, 1981). The women with intact perinea in the three previous studies consistently reported significantly less pain, need for analgesia and an early resumption of sexual intercourse.

The absence of sutures and therefore the absence or reduction of perineal pain is a great advantage for any woman adjusting to motherhood, as pain may contribute to disturbance of the postpartum mood. Reading et al. (1982) suggest that the effect of pain is potentially bi-directional, with either the sensations of pain being suppressed by the pleasure of the baby, or the pain acting as a detraction from the pleasure of motherhood and thus

affecting the attitudes and behaviour towards the baby.

The Effect of the Degree of Perineal Trauma on Pain.

The second hypothesis, which predicted that the women with vaginal or first degree tears would self report significantly less pain than the women with an episiotomy or second degree tear was supported.

In this study, significant differences in the percentages of women who reported no pain or significantly less persistent pain on day three; less analgesic requirements on day three, at six weeks and three months; and an earlier resumption of sexual intercourse with comfort was observed between the subgroups of women who had sustained a vaginal or first degree perineal tear (minor subgroup) and the combined subgroups of women who had an episiotomy or a second degree tear (major subgroup). The data indicated that the minor subgroup were, overall, the more comfortable subgroup in terms of the incidence, intensity and duration of perineal pain.

These findings are consistent with recent prospective studies and a randomised trial comparing the use of episiotomy with perineal tears (Cater, 1984; Harrison et al., 1984; Larsson et al., 1991). The women who sustained first degree tears in these studies were shown to report only low to moderate pain scores which were consistently lower than the pain scores reported by the women with episiotomy and second degree tears. Further, although the episiotomy and second degree tear pain ratings were found to be at a similar level, the studies showed that the second degree tear groups pain levels were never greater than the pain levels reported by the episiotomy groups. In fact, Cater (1984) and Larsson et al. (1991) reported that the episiotomy groups reported the most severe pain. In addition, the need for analgesia was found to be lowest for the women with first degree tears in these studies. Of the patients with first degree tears, Larsson et al. (1991) reported that significantly less women required analgesia than the episiotomy group on the fifth day (13.2% compared to 36.6%) and at follow-up eight to twelve weeks postpartum. Significantly less women with tears had reported healing problems from the perineum or dyspareunia.

In comparison, other recent prospective studies (Abraham et al., 1990; Sleep et al., 1984; Thranov et al., 1990), which have only reported on the comparison between the combined groups of first and second degree tears with episiotomy, have shown that there was no difference between groups in the time taken for the perineum to feel comfortable or for sexual intercourse to become comfortable.

A common conclusion drawn by the authors of all the studies (Abraham et al., 1990; Cater, 1984; Harrison et al., 1984; Larrson et al., 1991; Sleep et al., 1984; Thranov et al., 1990) was that the use of an episiotomy neither exacerbated, nor alleviated, the pain experienced by the women in the longer postpartum period.

The Effect of Mode of Vaginal Delivery With Perineal Trauma on Pain.

The third hypothesis, which stated that the participants undergoing an assisted vaginal delivery with an episiotomy (assisted subgroup) would experience a

significantly greater intensity and duration of perineal
pain than those participants undergoing a spontaneous
vaginal delivery with tearing or an episiotomy (spontaneous
subgroup) was supported.

This hypothesis was tested by the researcher because
it was considered relevant that if episiotomy was to be
properly evaluated then the pain and discomfort of those
participants who underwent an assisted delivery with
episiotomy should be included in the overall comparison of
subgroups.

In this study, the intensity of reported pain, as
assessed by visual analogue pain scores, was consistently
and significantly higher in the assisted subgroup on day
three. The only accepted pain score on which the assisted
subgroup reported significantly less pain was whilst being
sutured, however, a further analysis revealed that the
majority (78.2%) of the assisted subgroup were sutured
under epidural analgesia or general anaesthesia. Thus the
majority of the subgroup had a total absence of pain. With
the realization that the majority of the assisted subgroup

had had epidural analgesia for suturing, and therefore also during labour, the finding that this subgroup had a significantly higher incidence of pain reported on day three was in agreement with other studies which have shown that patients who have epidural analgesia in labour experience more perineal discomfort in the immediate postpartum period (Buchan & Nicholls, 1980; Harrison et al., 1984; Khan & Lilford, 1987).

It was very interesting for the researcher in this present study to find that the mean scores for the pain experienced whilst being sutured were far higher for the women sutured under local anaesthetic than the mean scores they reported for the pain intensity items on day three. This was despite the careful clarification made with each participant that the scoring on the visual analogue scale for this question did not include the examination of the perineal trauma prior to suturing or the infiltration of local anaesthetic. This finding was also identified by Kitzinger and Walters (1981) in their study of women's experiences following childbirth. It is a concern which suggests that more attention should be placed on finding

solutions to alleviate the pain during suturing, such as identifying an optimum time for suturing, or to find out why the suturing is felt to be painful despite local anaesthesia. There may be psychosomatic factors involved that warrant further research.

In this study, the first analysis used to test this hypothesis showed that the assisted and spontaneous subgroups were also significantly different with respect to pain intensity scores for most measures at six weeks and three months. However, with the second analysis, when the smaller assisted subgroup (sutured only under epidural or general anaesthesia) were compared to the smaller spontaneous subgroup (sutured only under local anaesthetic) the only difference to remain statistically significant was the overall perineal pain measure score at six weeks. This finding lends further support to the observation made of more intense short term pain for women sutured under epidural or general anaesthetic, but why the longer term results changed to less significant findings remains unclear.

Comparisons were made between the assisted and spontaneous subgroups for the duration of perineal pain at six weeks and three months, in this study, by the women's pain ratings and pain relief requirements. There were no significant differences shown between the two subgroups for these measures except for the spontaneous subgroup resuming sexual intercourse with comfort earlier, although the percentages did show that the assisted subgroup had reported slightly more pain than the spontaneous subgroup for the majority of items.

Four previous studies have examined the correlation between assisted vaginal deliveries and perineal pain (Abraham et al., 1990; Garner, 1982; House et al., 1986; Reading et al., 1982). Irrespective of the degree of damage to the perineum, these authors have also shown an association between reports of increased pain following assisted deliveries. House et al. (1986) observed that a large proportion of the long term problems in relation to the perineum were associated with women having a forceps delivery. However, the authors (House et al., 1986) did suggest that many of the problems the women encounter may

be due to the need for the assisted delivery itself rather
than the episiotomy. Further research is needed in this
area to elucidate that suggestion.

The Short and Long-Term Effects of Perineal Trauma.

The fourth objective of this study concerned
identifying the short and long-term (three month)
physiological and painful effects of episiotomy and/or
perineal tears sustained by women during vaginal delivery.

In this study, the measures used in the REEDA scale
(redness, (o)edema, ecchymosis, discharge and
approximation) showed no significant differences between
the three perineal subgroups. However, a comparison
between the subgroups revealed that the first degree tear
subgroup had the lowest scores with a majority of the score
'0', whilst the episiotomy subgroup showed the highest
scores. These findings are in contrast to a recent study
(Hill, 1989) which showed REEDA scale scores to be highest
in the women who sustained only a laceration during
delivery. Hill's (1984) findings, which supported a

concern for greater tissue trauma caused by perineal laceration, were consistent with the report by Harrison et al. (1984) that the severity of bruising and oedema among their patients sustaining a first degree tear was similar to that found in their episiotomy and second degree tear groups.

The reason for the difference between this study and the previous studies is unclear. It is acknowledged by the researcher that interrater reliability was not determined between the midwives using the REEDA scale in this study and that factor could have made a difference in the overall scoring, however, the midwives were experienced postnatal midwives and were familiar with checking perineal healing on a daily basis and the REEDA scale does provide precise, objective measures for scoring.

Davidson (1974) devised the REEDA scale in 1970 as a tool for midwifery students to use for describing postpartum perineal healing and for relating the healing to the comfort and discomfort of a patient. In this study the degree of participant's self reported pain, as measured on

the visual analogue scale, appeared to correspond with the REEDA scale scoring process; that is, the participants in the first degree tear subgroup who scored least with the REEDA scale also reported the least pain. Similarly, the episiotomy subgroup reported the most pain.

In this present study highly significant differences were found between the four subgroups of women in the percentages of degrees of pain severity. Those women with episiotomy experienced more pain in the first three days than the tear subgroups. By percentages, the episiotomy subgroup reported significantly less mild pain and more moderate and severe pain than the second and first degree tear subgroups. Conversely, the first degree tear subgroup showed the greatest percentage of mild pain and least moderate pain, whilst 95% of the intact subgroup reported no pain or only mild pain.

A direct comparison could not be made with the studies by Cater (1984) and Kitzinger and Walters (1981) because of the difference in days postpartum. Cater (1984) surveyed her women five days postpartum while Kitzinger and Walters

(1981) surveyed their women seven days after delivery. However, their findings were consistent with the findings in this present study, albeit, the actual percentages for each degree of pain severity differed but the differences in pain ratings between each subgroup were the same.

No significant differences were found in this present study for the degrees of pain severity between the four perineal subgroups at six weeks or three months, although a trend towards significance was shown at six weeks. By percentages, the women in the episiotomy subgroup reported less mild pain and more moderate pain than the other three subgroups for both time periods. While the first and second degree tear subgroups were similar in their distribution of mild, moderate and severe pain responses, the intact subgroup (100%) reported only mild pain or were pain free.

A large proportion of the participants from each subgroup in this study reported problems with the healing of their perineal wound for which they needed to consult their doctor at six weeks and three months. The

percentages for each subgroup were, in order: episiotomy, 26.1% and 33.8%; second degree tear, 18.6% and 26.1%, and first degree tear, 19.3% and 22.1%.

The four most frequently identified major problems the women experienced at both six weeks and three months were perineal pain, wound infection, delayed perineal healing, and perineal wound breakdown. These problems were consistent with the nature of problems identified by previous authors (Beischer, 1967; Buchan & Nicholls, 1980; Isager-Sally et al., 1986; Reading et al., 1982; Sleep et al., 1984) in their studies of episiotomy patients. Similarly, of their samples, Isager-Sally et al. (1986) and Reading et al. (1982) found 33% and 31.9%, respectively, had to seek professional help within three months of delivery for a problem related to the episiotomy repair. In contrast, Sleep et al. (1984) reported that a similar proportion of 12% of women in each of their restrictive and liberal groups had sought medical advice because of perineal problems. They did not report the differentiation between the degrees of trauma in each group, but did note that consultation was more frequent among primiparas than

multiparas.

Infection is a recognized complication of perineal trauma because of contamination by pathogens from the vagina and lower intestinal tract. In this study, the researcher is uncertain whether culture of the perineal wounds was carried out, so absolute diagnosis of wound infection could not be made. However, it is assumed that participants reported infections on the basis of information from their doctors.

The prevalence of perineal wound infection between the perineal trauma subgroups almost reached statistical significance (p <.053) at six weeks. The episiotomy subgroup were shown to report the highest incidence of perineal infection (7.1%) then the second degree tear subgroup (5.4%) and the first degree tear subgroup the lowest (1.9%).

The episiotomy infection rate of 7.1% found in this present study is broadly in keeping with the episiotomy wound infection rates found in other studies (Larsson et

al., 1992; Livingstone et al., 1974) which showed reported rates of 10% and 6% respectively, whilst Garner (1982) reported a slightly higher episiotomy infection rate of 12%. Garner (1982) and Larsson et al. (1992) reported wound infection rates of 3.7% and 2%, respectively, with perineal tears. These findings therefore appear to reflect a true difference between the risk of infection and the degree of trauma which indicates that a perineal tear is clinically preferable to an episiotomy.

In his study, Garner (1982) reported a greater problem with wound breakdown and infection in the group of women who had a spontaneous delivery with episiotomy as compared to those women delivered with the aid of forceps. He suggested that, although forceps deliveries may need larger episiotomies, the wound is repaired immediately and therefore there is less risk of infection.

There was agreement between this present study and the study by Kitzinger and Walters (1981) that the interval between the birth and the commencement of perineal suturing was found not to be significantly related to the incidence

of perineal infection, although, as the different percentages in this study indicate, it did appear that there was a higher risk of infection the longer the perineal wound was left unsutured. This finding lends support to Garner's (1982) theory that the immediate repair following a forceps delivery reduces the risk of infection.

It was anticipated that the number of packets of suturing material used would make a difference to the levels of pain reported. However, in this study, a highly significant difference was found between the number of suturing material packets used and the prevalence of perineal wound infection. This finding was irrespective of the extent of the perineal wound. Only the type of suturing material used has been implicated before as a causal factor in maternal morbidity (Grant, 1986) so this finding was unexpected by the researcher. A search of the literature failed to find any other studies making a similar observation of the relationship between packet count and infection. Further investigation is required of these last two factors as perineal repair now has implications for midwifery. It seems possible, but by no

means certain, that with perineal repair becoming an integral part of the midwifery role at this participating hospital and in the United Kingdom (Grant, 1986), that the risk of perineal infection and subsequent wound breakdown could be reduced. Midwives would be in the situation to undertake immediate repair of the women they deliver rather than waiting for a medical officer to become available.

Delayed perineal healing was found to be the predominant problem in the study by McGuinness et at. (1991). These authors noted that 7.7% of the women in their episiotomy group experienced delayed perineal healing compared with 2.2% of the women in their no-episiotomy group. Although delayed healing was not the predominant problem reported in this present study, there was agreement between the two studies with the rates shown, particularly at six weeks postpartum. This present study, however, showed a higher rate of delayed healing (10.4%) within the episiotomy subgroup at three months, which was significantly higher than the first degree tear subgroup rate of 2.52% (p <.009). Delay in the approximation of perineal wounds increases the risk of infection and can

lead to worse anatomical results or disfigurement.

The results of this study are in keeping with the study by McGuinness et al. (1991) which supports two currently opposing viewpoints. These are: women with perineal tears do appear to experience fewer healing problems than episiotomies, and episiotomies do not result in better healing and improved recovery for the women.

The different perineal outcomes in this study appeared to have little effect on the frequency of involuntary loss of urine three months after delivery. Large proportions of women from each subgroup experienced this problem with the episiotomy subgroup reporting the highest incidence (29.7%) followed by the intact subgroup (26.6%), the second degree tear subgroup (24.6%) and the first degree tear subgroup (24.1%). Similarly, in the West Berkshire Perineal Management Trial, Sleep et al. (1984) reported that a large proportion of women experienced involuntary loss of urine, although their rate of 19% from each management group was lower than the rates found in this present study.

There is no evidence from these and the findings of Sleep et al. (1984) that an episiotomy prevents pelvic relaxation and thereby urinary incontinence. In fact, the authors of several studies that have been undertaken on the incidence of urinary stress incontinence during pregnancy and in the puerperium have found that the onset of stress incontinence always begins before the puerperium and cannot be attributed to childbirth itself. The authors are in agreement that the pregnancy itself and hereditary factors predispose to incontinence rather than parturition trauma (Francis, 1960; Iosif, 1981; Stanton, Kerr-Wilson, & Grant Harris, 1980).

These urological findings also support the work of others. The function of the pelvic floor muscles postnatally was found by Gordon and Logue (1985) not to be related to the perineal trauma at delivery. Their study findings neither supported the theory that episiotomy results in improved healing and better muscle function nor provided evidence to suggest that an intact perineum in childbirth gave rise to deficient muscle function due to overstretching. Instead, Gordon and Logue's (1985) study

confirmed the work by Kegel (1948) and Montgomery (1986), that the amount of perineal muscle exercise a woman undertakes is an important factor in the prevention of pelvic floor relaxation. Montgomery (1986) found that Oriental and African women rarely have problems with pelvic floor relaxation because, unlike Europeans, it is their accepted custom for the mothers to teach the daughters how to use and control their pelvic floor muscles in preparation for childbearing and following childbirth. Further, Montgomery (1986) believes that the pain experienced by the women following childbirth can inhibit movement and thus lead to atrophy of the pelvic floor muscles due to prolonged inactivity.

The problems experienced by the women in this study are a concern which impacts on the conceptual framework guiding this study, including the ability of the women to self-care and the body's capacity to heal. An emphasis in postnatal teaching in the hospital is placed on postpartum perineal care; however, it would appear from the findings in this study that either the information of postpartum perineal care received by the participants was not

sufficient, or the women were not able to assimilate the information given due to various reasons; for example, fatigue, pain, euphoria, nervousness.

The Relationship Between Perineal Suturing Methods and Pain Experience.

Objective 5 sought to identify the relationship between the different suturing methods used and the intensity and duration of perineal pain.

The results of this objective are discussed under two parts: subcuticular versus transcutaneous skin sutures, and continuous versus interrupted muscle sutures.

Skin Sutures:

Although the results for the intensity of reported pain, for this aspect of the present study, showed a trend for the women sutured by the transcutaneous method to experience slightly more intense pain than the women sutured by the subcuticular method, only one item reached

statistical significance (p <.030). This item was for pain whilst voiding at six weeks within the second degree tear subgroup.

The pain relieving measures and pain inducing activities analysed for the duration of pain revealed four significant results at six weeks and three months, three of which showed that the women in the episiotomy subgroup, who were sutured by the transcutaneous method, reported more pain. The fourth significant result showed that the women with subcuticular sutures in the second degree tear subgroup experienced dyspareunia for longer.

No clear difference in outcome emerged in the study reported here between the techniques of subcuticular and transcutaneous skin sutures. However, these inconclusive findings are in agreement with other studies (Buchan & Nicholls, 1980; Mahomed et al., 1989; Isager-Sally et al., 1986) which have also only been able to suggest less perineal pain after subcuticular suturing. Isager-Sally et al. (1986) suggested that the short term pain experienced by the women in their study with transcutaneous sutures was

probably due to the fact that whereas it is very easy to
over-tighten interrupted skin sutures, thus restricting the
tissues when oedema develops, the subcuticular suture is
difficult to over-tighten and leaves space for the oedema.
Further, both Buchan and Nicholls (1980) and Isager-Sally
et al. (1986) indicated that the type of suture material
used may have been responsible for the longer term
discomfort experienced by the women in their studies.
Isager-Sally et al. (1986) compared nylon and Dexon suture
materials for the skin closure. The group of women who had
nylon sutures had their sutures removed on the fifth day,
whilst the remaining two groups had Dexon skin sutures
which were left to dissolve normally. The normal time for
polyglycolic sutures (Dexon and Vicryl) to be absorbed is
between 60 to 90 days (Buchan & Nicholls, 1980). Buchan
and Nicholls (1980) and Isager-Sally et al. (1986)
concluded that the longer term pain and dyspareunia
experienced by the women sutured with Dexon may have been
due to the persistence of the skin sutures.

The impression of the researcher in this present study
is in accordance with the observations made by Buchan and

Nicholls (1980) and Isager-Sally et al. (1986) but would add that the degree of trauma sustained by the women also appeared to make a difference.

Muscle Sutures:

This second part of the objective investigated the effect two methods of repair to the perineal muscle layers made on the intensity and duration of pain. The two suturing techniques used in this study were a continuous suture and interrupted sutures. These were compared within the episiotomy and second degree tear subgroups.

In the short term (three days) no significant differences were found between the continuous and interrupted sutures for pain intensity. However, two items, overall perineal pain within the episiotomy subgroup and walking within the second degree tear subgroup, showed trends for the participants with interrupted sutures to report a higher level of pain.

The difference in intensity of reported pain was more

obvious at six weeks after delivery. Five significant differences were shown: four were within the episiotomy subgroup for overall perineal pain (p <.035), sitting (p <.021), walking (p <.016) and voiding (p <.009) and one was within the second degree tear subgroup for defecation (p <.021). All five items showed a significantly greater degree of pain was reported by the women with interrupted sutures.

In this study, the two methods of muscle repair appeared to make less difference to the duration of reported pain. Only one item was found to be significantly different within the episiotomy subgroup, touching the perineum (p <034). A further five items showed trends towards significance. These findings also indicated that the women with interrupted muscle sutures experienced more pain.

Although not overwhelming, the findings from this present study do suggest a relationship between muscle suturing methods and perineal pain. Interrupted muscle sutures were found to cause more pain in both intensity and

duration than a continuous muscle suture. The differences observed may be due either to the presence of knots within the perineal muscle layers, as a greater proportion of the pain inducing activities that reached or neared significance were related either to touch or pressure exerting activities, or the differences may simply be due to the type of suturing material used. No published studies, comparing perineal muscle repair techniques, were found in the literature, therefore further comparative studies of these two methods of perineal muscle repair are warranted.

A Comparison of Chromic Catgut and Vicryl and Their Effect on Perineal Pain.

Objective 6 sought to identify the relationship between the different suturing materials used and the intensity and duration of perineal pain.

The two types of suturing materials used for perineal repair in this study were chromic catgut (size 2/0) and polyglycolic acid (size 2/0). In the majority of

polyglycolic acid suturing cases Vicryl (polyglactide, Ethicon Ltd) was used, however, three Dexon (polyglycolide, Davis & Geck Ltd) cases were merged with the Vicryl for the analysis.

A limitation of this objective was the relatively smaller number of women sutured with chromic catgut ($\underline{n}$ = 112), although their distribution between each of the perineal trauma subgroups was fairly equal.

In this study, it was not possible to demonstrate any statistically significant differences in the intensity of pain reported between the catgut and Vicryl participants, although there was one item where a trend for Vicryl to be reported as slightly more painful was observed ($\underline{p}$ <.150). This item was observed within the first degree tear subgroup for pain reported for sitting on day three. The non significant findings from this present study are consistent with two recent randomized prospective studies comparing catgut and Dexon for episiotomy repair (Olah, 1990; Roberts & McKay Hart, 1983). These authors also reported finding no significant differences between catgut

and Dexon suturing materials. Roberts and McKay Hart
(1983) did, however, report a significant reduction in
analgesic use for a third group of women in their study who
were sutured with Dexon and received Chymoral and who were
compared to a fourth group of women who were sutured with
catgut and received a placebo.

Three other randomized prospective studies have been
carried out to compare chromic catgut to Dexon for
episiotomy repair (Livingstone et al., 1974; Mahomed,
Grant, Ashurst, & James, 1989; Rogers, 1974). In the
studies by Livingstone et al. (1974) and Rogers (1974), the
authors found the prevalence of pain in their chromic
catgut groups to be highly significant with approximately
twice the number in those groups reporting more pain than
the Dexon groups. Similarly, Mahomed et al. (1989)
reported significantly less women in their Dexon group used
oral analgesia in the immediate postpartum period.

In this present study, the longer term follow-up for
the duration of pain also failed to demonstrate any
significant differences between the Vicryl and chromic

catgut groups, although several trends towards significance
were observed.   The trends that emerged from this study
indicated that within the episiotomy and first degree tear
subgroups the women sutured with catgut tended to be more
comfortable at six weeks and three months.   Conversely, in
the second degree tear subgroup, the women sutured with
Vicryl tended to be more comfortable.

No clear difference emerged in this study between the
short and long-term effects of chromic catgut and Vicryl.
The two major trauma subgroups, that is, episiotomy and
second degree tears, showed similar trends but in opposing
directions   for   the   suture   materials.   That   these
differences did not attain statistical significance may
reflect the small catgut sample size.

Unfortunately, most of the studies reported previously
(Livingstone et al., 1974; Olah, 1990; Roberts & McKay
Hart, 1983; Rogers, 1974) did not include adequate follow-
up after discharge from hospital so it is difficult to
compare the results of this study in the longer term to
comparative   studies;   that   is,   chromic   catgut   versus

polyglycolic acid sutures. Livingstone et al. (1974)
included a six week follow-up in their design but only
"about one third" of the 100 participants attended the
clinic at six weeks. The authors concluded that "by six
weeks postpartum all episiotomies were healed" and that
"none of the patients had been troubled by persistance of
sutures" (p. 236).

Only one study (Mahomed et al., 1989) included a three
month follow-up after delivery. In their study the authors
found both perineal pain and dyspareunia were equally
common between the chromic catgut and Dexon groups. The
only striking finding reported by Mahomed et al. (1989) was
that the removal of some suture material was far more
common in the Dexon group (40%). This was particularly
marked in the first ten days, but persisted for up to three
months after delivery. The commonest reasons given for
removal were "irritation" and "tightness". The high rate
of suture removal in the Mahomed et al. (1989) study is in
sharp contrast to the suture removal rate found in this
present study. A total of 30 participants reported having
their sutures removed, however, of these, 26 (3.15%) cases

were sutured with Vicryl.

An observational, anecdotal report from a senior physiotherapist at the participating hospital in this present study suggested that there was a large problem with Vicryl sutures in the longer term. The physiotherapist telephoned the researcher because she was concerned by the number of women sutured with Vicryl who were referred to her for ultrasound therapy to the perineum for persistent perineal pain. Although she was unable to give the exact prevalence of the problem, the physiotherapist described the residual Vicryl sutures still imbedded in the women's perineums as "encapsulated splinters" (M. Kneebone, personal communication, August 4, 1992).

This physiotherapist's observation and the evident need to remove Dexon or Vicryl sutures from 40% (Mahomed et al., 1989) and 3.2% of the sample population in this study further questions as to which material is most appropriate for perineal repair. The lack of published research on the longer-term effects of chromic catgut and polyglycolic acid suture materials suggest that further research is warranted

to resolve the question of which suture material should be chosen for routine perineal repair.

The Relationship Between Short Term Pain and Suturing Anaesthesia.

Objective 7 sought to identify the relationship between the type of anaesthesia used for perineal suturing and the intensity of short-term (three day) perineal pain.

In this study, the intensity of the participant's perineal pain, as assessed by the visual analogue scale scores, was found to be consistently higher among the three perineal trauma subgroups for the women sutured under epidural analgesia. The only significant differences to be shown, however, were for the three items within the episiotomy subgroup. These items included: overall perineal pain (p <.002), sitting (p <.047), and walking (p <.001).

Similarly, for the women sutured under epidural analgesia highly significant differences were found within

the episiotomy and second degree tear subgroups for reported pain. More women in the epidural groups within these two perineal subgroups reported persistent perineal pain (p <.025 and p <.031, respectively). The one item to reach statistical significance for the pain inducing activities was within the episiotomy subgroup for 'going to sit down' (p <.002). This difference also indicated that the women sutured under epidural reported more pain.

Analgesic requirements were lower for the participants sutured under local anaesthetic in this present study. The differences that did emerge between the two suturing anaesthesia groups were more apparent in the two major perineal subgroups, viz. episiotomy and second degree tear. A significantly higher proportion of the women in the episiotomy subgroup, and a higher proportion of the women in the second degree tear subgroup, who were sutured under local anaesthetic required no form of analgesia. For the remaining participants in the episiotomy subgroup, who did require some form of pain relief, significantly more women who were sutured under epidural required analgesic tablets and found comfort using sitz baths. Likewise, more women

sutured under epidural analgesia in the second degree tear subgroup used significantly more ice packs on the perineum and ultrasound therapy. Of the trends that appeared within the first degree tear subgroup's analgesic use, a tendency was shown for the epidural group of women to use more analgesic tablets, more ultrasound therapy and more hot packs on the perineum.

The findings from this present study are in agreement with three other studies (Buchan & Nicholls, 1980; Harrison et al., 1984; Khan & Lilford, 1987) which reported considerably higher severities of pain and analgesic requirements for patients who had epidural analgesia in labour during the first two to five days following delivery.

Two possible explanations have been put forward in the literature to explain why women with epidural analgesia during labour show the potential for more severely experienced perineal pain. Buchan and Nicholls (1980) and Crawford (1982) suggest that the enhanced perineal pain after epidural analgesia is related to the fact that the

patients have not had much pain during labour and delivery and are therefore not "acclimatized" to pain.

The alternative suggestion is that the enhanced perineal pain is due to the pressure of oedematous tissue trapped within sutures (Garrey, 1982; Khan & Lilford, 1987). Khan and Lilford (1987) presented the rationale that in patients without epidural analgesia the local anaesthetic infiltration produces temporary oedema of the perineal tissues which minimises the effect of tension caused by the eventual postoperative traumatic oedema. Crawford (1982) tested this theory by conducting a small study in which, under the epidural, the episiotomy site was infiltrated with normal saline, but found it afforded no advantage. In contrast, Khan and Lilford (1987) found a highly significant reduction in pain scores and decrease in analgesic requirements by infiltrating the perineum in epidural patients with normal saline. These contrasting findings by Crawford (1982) and Khan and Lilford (1987) suggest a comparative study of epidural analgesia and perineal management is required. With the increasing rate of epidural analgesia during labour and delivery more

patients will be subjected to increased perineal pain and analgesic consumption in the puerperium unless a safe, effective method can be found to reduce it.

It was interesting to observe, in this present study, that the majority of the alternative pain relieving methods, chosen by the participants who had epidural analgesia, were methods commonly used to relieve painful pressure or oedema rather than just pain itself. This observation would tend to agree with the perineal oedema theory suggested by Khan and Lilford (1987).

The Effect of Birthweight on the Degree of Perineal Trauma.

Objective 8 sought to identify the relationship between the weight of the newborn at birth and the degree of perineal trauma.

In this study, highly significant differences in birthweight means were found between the four subgroups of participants (p <.0002). This finding was unexpected by the researcher. It had not been anticipated that such

clear differences would be defined for each subgroup of participants.

A significant difference that was expected, was found between the multiparous and primiparous groups within each of the four subgroups.

The main differences to emerge from this study were that the women who sustained a second degree tear tended to have the largest babies followed, in order, by the episiotomy subgroup, the first degree tear subgroup, and the intact subgroup. Multiparas tended to have larger babies than the primiparas within each subgroup.

Few studies have reported birth weight as a factor associated with the incidence of perineal trauma, however, five recent studies are in agreement with this present study and have shown a relationship between the two (Harrison et al., 1984; Nodine & Roberts, 1987; Reynolds & Yudkin, 1987; Roberts & Kriz, 1984; Wilcox et al., 1989). Nodine and Roberts (1987), Reynolds and Yudkin (1987) and Wilcox et al. (1989) reported a broad relationship. These

authors found that the incidence of perineal laceration was decreased when the infant's birthweight was less than 2,500 grams or 'small'. Likewise, Nodine and Roberts (1987) and Wilcox et al. (1989) found that an increase in the incidence of perineal laceration was associated with an infant weight of 4000 grams or more.

When the mean birthweights found in this study were compared to the mean birthweights in the Harrison et al. (1984) study, the weights for each subgroup of participants were surprising?y similar. Harrison et al. (1984) however, did not have a second degree tear group included in their analysis.

In comparison to this study, two authors (Blondel & Kaminski, 1985) reported that in an earlier study they had found that episiotomy was not linked to birthweight.

Resumption of Sexual Intercourse and Dyspareunia.

Objective 9 sought to determine if a history of dyspareunia had any relationship to the degree of perineal trauma and the intensity and duration of dyspareunia following childbirth. Sexual intercourse following childbirth is frequently accompanied by pain, although the actual incidence varies from study to study.

In this study, whilst some women had resumed sexual intercourse within one week of delivery, 60.8% of the participants had attempted or resumed intercourse by six weeks and 85.2% had resumed intercourse by three months. Between perineal subgroups there was an apparent difference in the percentages of women who had resumed intercourse at both six weeks and three months. By three months less women in the episiotomy (82.8%) and second degree tear (80.5%) subgroups, compared to the first degree tear (88%) subgroup, had resumed coitus, while almost all of the intact subgroup (94.7%) had.

Although not asked of the participants, many women

added an explanation of why they hadn't resumed intercourse at three months. Apart from the few who did not have a current partner, the commonest reasons were: too tired, anticipation that intercourse would be painful, and (in the height of the summer) too hot.

Dyspareunia.

Of the 704 participants in this study who had resumed sexual intercourse by three months, 15.6% had reported that they were still experiencing pain with intercourse, or dyspareunia. This rate was slightly less than the dyspareunia rates of between 16% and 23% shown in several other studies (Abraham et al., 1990; Beischer, 1967; Buchan & Nicholls, 1980; Coats et al., 1980; Garner, 1982; Isager-Sally et al., 1986; Kitzinger & Walters, 1981; Larsson et al., 1991; Lumley, 1978; Sleep et al., 1984). The prevalence of dyspareunia reported by the majority of these studies at three months was 22%.

In an early study (Beischer, 1967) which assessed the anatomical and functional results of mediolateral

episiotomy, the author found a dyspareunia rate of 23% at three months postpartum. Of these women, Beischer (1967) reported that 6% had severe, persistent and disabling coital difficulties. Beischer (1967) considered that technical mismanagement of the episiotomy repair and quality of the healing were the two most important contributory factors for dyspareunia. Another factor contributing to the high reported rates of dyspareunia suggested by Reading et al. (1982) was the direction of the episiotomy incision, with the mediolateral angle being associated with a much greater incidence of pain than a midline incision. Culture could also be a predisposing factor. It was interesting to note that in Beischer's (1967) study the author mentioned that the incidence of dyspareunia was 32% in the 131 Australian born patients and 48% in the 106 who were of European birth.

The suggested factors contributing to the incidence of dyspareunia may explain the differences between the subgroups in this study for the duration in weeks for sexual intercourse to become confortable. In this present study it was shown that the mean duration in weeks for

comfortable intercourse was four weeks in the intact subgroup, six weeks in the first degree tear subgroup, seven weeks in the second degree tear subgroup, and eight weeks in the episiotomy subgroup. Although a second degree tear and episiotomy incur approximately the same extent of trauma, the slight difference in comfort weeks could be due to the fact that the majority of tears in this study were midline, whereas the majority of episiotomies were mediolateral.

The distinct mean duration in weeks for comfortable intercourse found between the subgroups in this study did not concur with the findings of Abraham et al. (1990). These authors reported that the results showed no difference in the time for sexual intercourse to be comfortable between the groups.

The various analyses carried out in this aspect of the study sought to answer the question of the intensity and duration of dyspareunia within the first three months. To do this, the participants who had a history of dyspareunia prior to the pregnancy were compared to the women who had

not experienced dyspareunia before. The majority of the findings from all the analyses in this study were consistent. The women who did have a history of dyspareunia reported significantly higher values for pain with sexual intercourse than the women without a history of dyspareunia (p <.0001) and were shown to take a significantly longer time in weeks before they reported coitus as being comfortable (p <.0001).

The consistent findings from this present study refute the suggestion made by Abraham et al. (1990) that dyspareunia before or during pregnancy does not appear to be a factor associated with poor outcome. The authors (Abraham et al., 1990) defined poor outcome as "the presence of perineal discomfort or of uncomfortable sexual intercourse for longer than the median times". Unfortunately, no other studies were found in the literature which have reported the comparative incidence of dyspareunia between the women with dyspareunia prior to the pregnancy and the women without previous dyspareunia.

In this study, it was shown that a history of

dyspareunia prior to the pregnancy was found to be predictive of an increased risk for a higher incidence of pain with sexual intercourse and a longer duration in weeks for sexual intercourse to become comfortable. The practical significance of this observation is readily appreciated since it should serve to alert the midwives and obstetricians to patients who should be referred for early physiotherapy evaluation and therapy.

Persistent dyspareunia can have tragic effects on a woman's sexuality and as Lumley (1978) concluded, when a couple have no other satisfactory method of communication it is likely that a disturbed sexual relationship due to dyspareunia will be stressful and could threaten a previously stable relationship.

Participants' Sensory, Affective and Evaluative Word Pain Descriptors.

The researcher had intended to use the short-form McGill Pain Questionnaire developed by Melzack (Melzack, 1987) for this study; however, when the Questionnaire was

pre-tested only four of the eleven sensory pain word descriptors were chosen by some of the mothers and none of the four affective pain word descriptors were selected. Therefore, the short-form questionnaire was not used in the study. In place of the questionnaire, the participants in this study were asked to describe their pain experience in their own words.

Melzack and Torgerson (1971) suggested that the language of pain could provide a means to assess the many dimensions of the pain experience rather than describing pain only in terms of intensity. The authors (Melzack & Torgerson, 1971) devised the standard long-form McGill Pain Questionnaire by categorizing words commonly used to describe pain, and classifying these words into three classes and sixteen subclasses to represent particular dimensions of the pain experience. The three classes of word pain descriptors include 42 sensory, 14 affective, and 10 evaluative word pain dimensions. Each word in the questionnaire is also rated on a 1-5 pain intensity dimension.

Statistical analysis of the data for this question in the present study was not conducted; rather the most commonly used words were categorized to determine whether any patterns emerged. The percentage of the women that selected particular words in this study provides a rough estimate of common pain language for acute postpartum perineal pain.

In this study, the words chosen by the women with an episiotomy or second degree tear tended to be of a wider range and higher in terms of pain intensity (as scaled by Melzack and Torgerson, 1971) than the first degree tear and intact perineum subgroups. Common words among the four subgroups were the evaluative words discomforting and uncomfortable.

It was interesting to find that very few women in this study chose affective word pain descriptors. The reason for this is unclear, unless it is a dimension of pain associated more often with chronic pain conditions rather than acute pain such as perineal pain.

The pattern of descriptive words found in this study support the findings of Cater (1984). Of particular interest was the similarity between the two study findings of frequently chosen words that were not part of the McGill classification scheme. These words were bruised and dragging.

Significance of the Study

Implications for Midwifery Practice

The results of this study will have implications for midwifery practice in the areas of:

1. Antenatal Preparation for Perineal Trauma.

The information obtained from this study may be used for providing routine explanation and preparatory counselling in the antenatal period to increase the women's knowledge of episiotomy and subsequent expected sensations in the puerperium. The topic of episiotomy during the antenatal period should be considered in greater depth as it may enhance the women's ability to cope with the perineal pain postnatally. At present the topic of episiotomy is often downplayed or ignored.

Women should be informed generally, but particularly during pregnancy, about the contribution of the pelvic muscles to the maintenance of continence and the role of

pelvic muscle exercise in building muscle strength. Women need more antenatal advice, teaching and encouragement of perineal muscle exercises to reduce the incidence of pelvic floor relaxation and its associated problems in the postpartum period.

2.   Intrapartum and Immediate Postpartum Management.

The results of this study indicated that episiotomy does not result in better healing or improved recovery for the women. Therefore, with regard to the management of the second stage of labour, the standard of clinical practice and technical skills of midwives should be reviewed. More expertise is required from midwives to undertake a spontaneous vaginal delivery without an episiotomy and with the least amount of trauma to the perineum. Midwives assisting with childbirth should carefully consider the clinical indications before performing an episiotomy. In addition, midwives need to initiate discussions with the women about the need for episiotomy, involving them in the decision-making.

To reduce the risk of infection and increase the women's satisfaction, perineal repair should be carried out as soon after the delivery as possible. Where perineal repair is a part of the midwife's role, midwives should become adept with the surgical repair procedure.

The method of suturing is also important for postnatal comfort, therefore midwives need to become skilled in using continuous muscle sutures and the subcuticular skin suturing method.

^. Postnatal Education.

Postnatal women need precise instruction on postpartum perineal care to advance women's self-care and pain management ability.

Preparatory counselling and information is required to heighten the awareness of both mother and partner to the predicted short and long-term effects of episiotomy or perineal lacerations. Information as to the nature of a satisfactory recovery would enable the women to identify

any deviations from the normal course of recovery that would warrant the attention of their doctor or a physiotherapist. The information should include the type of suturing material used and the length of time it takes to dissolve.

Pamphlets or booklets are an ideal material resource for perineal care information and for reinforcement of advice already given by the midwives, particularly when women are discharged from hospital early in the puerperium. Therefore it would seem important for midwives to produce and distribute this type of literature to all women with perineal trauma.

Midwives should incorporate measures that promote the health of the pelvic musculature through postnatal teaching and encouragement of pelvic muscle exercises, with more emphasis placed on what a woman can achieve for herself. Women who experience incontinence of urine or faeces should be scheduled for follow-up evaluation within two to three months of childbirth.

Postnatal women and their partners should be adequately prepared for some of the sexual, emotional or painful problems that may be encountered. They need to know what to expect, when to anticipate resuming sexual intercourse and how to reduce discomfort during the first intercourse; for example, using adequate lubrication and controlled penetration.

4. **Auditing the Outcome of Midwifery Care.**

Consumer perineal outcome evaluation should be an on-going process of quality assurance by midwives; for example, auditing their episiotomy and perineal tear rates and outcome of perineal repair.

Directions for Future Research in Perineal Management

Based on the findings of the current study, it is recommended that future research should be directed toward:

*   A controlled, comparative study of perineal management in patients sutured under epidural analgesia. That is, with or without prophylactic infiltration of the episiotomy site with normal saline to reduce the intensity of short-term perineal pain.

*   A longer-term comparative study of intact perinea, first degree tears, second degree tears and episiotomies with respect to the long term sequelae such as pelvic relaxation, urinary and faecal incontinence, cystoceles, rectoceles, and uterine prolapse. The long term consequences of vaginal delivery on the development of these sequelae have not been thoroughly studied.

*   Evaluating the education of midwives and the extension of the midwifery role to undertake perineal repair in relation to the implications for both mothers and midwives.

* A randomised, controlled study to compare the continuous versus interrupted suturing method of perineal muscle repair.

* A randomised, controlled study of the longer term effects of Vicryl and Chromic Catgut suture materials.

* Identifying the optimum suturing time following childbirth.

* Identifying the relationship between the incidence of infection and the number of packets of suturing material used in an individual perineal repair and the length of delay before perineal suturing is carried out.

* A prospective study covering the psychosomatic factors influencing the pain experience pre and postpartum to improve midwives' knowledge of the risk factors.

* Identifying the association between reports of pain and perineal related problems with assisted vaginal deliveries.

* Identifying the relationship between the need for the performance of a forceps delivery or vacuum extraction and postpartum perineal pain and associated problems.

* A clinical study on the prevention or the minimization of long term perineal discomfort and dyspareunia.

References

Abraham, S., Child, A., Ferry, J., Vizzard, J., & Mira, M. (1990). Recovery after childbirth: A preliminary prospective study. The Medical Journal of Australia, 152(1), 9-12.

Adams, M. (1983). Bailliere's midwives' dictionary (7th ed.). London: Bailliere Tindall.

Avery, M. D., & Burket, B. A. (1986). Effect of perineal massage on the incidence of episiotomy and perineal laceration in a nurse-midwifery service. Journal of Nurse-Midwifery, 31(3), 128-133.

Banta, D., & Thacker, S. B. (1982). The risks and benefits of episiotomy: A review. Birth, 9(1), 25-30.

Beischer, N. A. (1967). The anatomical and functional results of mediolateral episiotomy. The Medical Journal of Australia, 2, 189-195.

Bennett, V. R., & Brown, L. K. (Eds.). (1989). Myles textbook for midwives (11th ed.). Edinburgh: Churchill Livingstone.

Beynon, C. L. (1974). Midline episiotomy as a routine procedure. The Journal of Obstetrics and Gynaecology of the British Commonwealth, 81, 126-130.

Blondel, B., & Kaminski, M. (1985). Correspondence: Episiotomy and third degree tears. British Journal of Obstetrics and Gynaecology, 92, 1297-1298.

Borgatta, L., Piening, S. L., & Cohen, W. R. (1989). Association of episiotomy and delivery position with deep perineal laceration during spontaneous delivery in nulliparous women. American Journal of Obstetrics and Gynecology, 160, 194-297.

Bromberg, M. H. (1986). Presumptive maternal benefits of routine episiotomy. A literature review. Journal of Nurse-Midwifery, 31, 121-127.

Buchan, P. C., & Nicholls, J. A. J. (1980). Pain after episiotomy - a comparison of two methods of repair. Journal of the Royal College of General Practitioners, 30, 297-300.

Buekens, P., Lagasse, R., Dramaix, M., & Wollast, E. (1985). Episiotomy and third-degree tears. British Journal of Obstetrics and Gynaecology, 92, 820-823.

Cater, L. (1984). A little knowledge. Nursing Mirror (Midwifery Forum), 159(11), i-viii.

Clayton, S. G., Lewis, T. L. T., & Pinker, G. D. (Eds.). (1985). Obstetrics by ten teachers (14th ed.). London: Edward Arnold.

Coats, P. M., Chan, K. K., Wilkins, M., & Beard, R. J. (1980). A comparison between midline and mediolateral episiotomies. British Journal of Obstetrics and Gynaecology, 87, 408-412.

Cogan, R., & Edmunds, E. P. (1977). The unkindest cut?. Contemporary Obstetrics and Gynaecology, 9, 55-59.

Crawford, J. S. (1982). Correspondence: Episiotomy. British Medical Journal, 284, 594.

Cunningham, F. G., MacDonald, P. C., & Gant, N. F. (1989). Williams Obstetrics (18th ed.). Norwalk, CT: Appleton and Lange.

Davidson, N. (1974). REEDA: Evaluating postpartum healing. Journal of Nurse-Midwifery, xix, 6-8.

de Leeuw, N. K. M., Lowenstein, L., Tucker, E. C., & Dayal, S. (1968). Correlation of red cell loss at delivery with changes in red cell mass. American Journal of Obstetrics and Gynecology, 100, 1092-1101.

Dunne, K. (1984). Characteristics associated with perineal condition in an alternative birth centre. Journal of Nurse-Midwifery, 29(1), 29-33.

Ewing, T. L., Smale, L. E., & Elliott, F. A. (1979). Maternal deaths associated with postpartum vulvar oedema. American Journal of Obstetrics and Gynecology, 134, 173-179.

Flint, C., & Poulengeris, P. (1987). The "know your midwife" report. London: Author.

Fox, J. S. (1979). Episiotomy. Midwives Chronicle & Nursing Notes, 92, 337-340.

Francis, W. J. A. (1960). The onset of stress incontinence. Journal of Obstetrics and Gynaecology of the British Empire, 67, 899-903.

Fraser, C. M. (1983). Selected perinatal procedures: Scientific basis for use and psychosocial effects: A literature review. ix. Episiotomy. Acta Obstetricia et Gynecologica Scandinavica, Supplement 117, 25.

Gainey, H. L. (1955). Postpartum observation of pelvic tissue damage: Further studies. American Journal of Obstetrics and Gynecology, 70, 800-807.

Garner, P. (1982). Dyspareunia after episiotomy. British Journal of Sexual Medicine, 9, 11-13.

Garrey, M. M. (1982). Correspondence: Episiotomy. British Medical Journal, 284, 595.

Gass, M. S., Dunn, C., & Stys, S. J. (1986). Effect of episiotomy on the frequency of vaginal outlet lacerations. The Journal of Reproductive Medicine, 31, 240-244.

Given, F. T., Jr., & Browning, G. (1988). Repair of old complete perineal lacerations. American Journal of Obstetrics and Gynecology, 159, 779-784.

Golde, S., & Ledger, W. J. (1977). Necrotizing fasciitis in postpartum patients. Obstetrics and Gynecology, 50, 670-673.

Gordon, H., & Logue, M. (1985). Perineal muscle function after childbirth. The Lancet, 2, 123-125.

Grant, A. (1986). Repair of episiotomies and perineal
    tears. British Journal of Obstetrics and Gynaecology,
    93, 417-419.

Hankins, G. D. V., Hauth, J. C., Gilstrap, L. C., Hammond,
    T. L., Yeomans, E. R., & Snyder, R. R. (1990). Early
    repair of episiotomy dehiscence. Obstetrics and
    Gynecology, 75, 48-51.

Harris, R. E. (1970). An evaluation of the median
    episiotomy. American Journal of Obstetrics and
    Gynecology, 106, 660-665.

Harrison, R. F., Brennan, M., North, P. M., Reed, J. V.,
    & Wickham, E. A. (1984). Is routine episiotomy
    necessary?. British Medical Journal, 288, 1971-1975.

Health Department of Western Australia. (1991). Data from
    midwives' notification system files birth events 1987 -
    1989. Perth: Author.

Henalla, S. M., Kirwan, P., Castleden, C. M., Hutchins, C.
    J., & Breeson, A. J. (1988). The effect of pelvic floor
    exercises in the treatment of genuine urinary stress
    incontinence in women at two hospitals. British Journal
    of Obstetrics and Gynaecology, 95, 602-606.

Hill, P. D. (1989). Effects of heat and cold on the
    perineum after episiotomy/laceration. Journal of
    Obstetrical Gynecological and Neonatal Nursing,
    March/April, 124-129.

Hospital Birth Register. (1990). King Edward Memorial
    Hospital for Women. Perth.

House, M. J., Cario, G., & Jones, M. H. (1986). Episiotomy
    and the perineum: A random controlled trial. Journal of
    Obstetrics and Gynaecology, 7, 107-110.

Inch, S. (1982). Birthrights: A parents guide to modern
    childbirth. London: Hutchinson and Co.

Iosif, S. (1981). Stress incontinence during pregnancy and
    in the puerperium. International Journal of Gynaecology
    and Obstetrics, 19, 13-20.

Isager-Sally, L., Legarth, J., Jacobsen, B., & Bostoffe, E. (1986). Episiotomy repair - immediate and long-term sequelae. A prospective randomized study of three different methods of repair. British Journal of Obstetrics and Gynaecology, 93, 420-425.

Kegel, A. H. (1948). Progressive resistance exercise in the functional restoration of the perineal muscles. American Journal of Obstetrics and Gynecology, 56, 238-248.

Khan, G. Q., & Lilford, R. J. (1987). Wound pain may be reduced by prior infiltration of the episiotomy site after delivery under epidural analgesia. British Journal of Obstetrics and Gynaecology, 94, 341-344.

Kitzinger, S. (Ed.). (1981). Episiotomy: Physical and emotional aspects. London: National Childbirth Trust.

Kitzinger, S., & Walters, R. (1981). Some women's experiences of episiotomy. London: National Childbirth Trust.

Kozak, L. J. (1989). Surgical and nonsurgical procedures associated with hospital delivery in the United States: 1980 - 1987. Birth, 16, 209-213.

Larsson, P-G., Platz-Christensen, J-J., Bergman, B., & Wallsterson, G. (1992). Advantage or disadvantage of episiotomy compared with spontaneous perineal laceration. Obstetrical and Gynecological Survey, 47(1), 27-28.

Laufe, L. E., & Leslie, D. C. (1972). The timing of episiotomy. American Journal of Obstetrics and Gynecology, 114, 773-774.

Lee, B. (1982). Episiotomy (correspondence). British Medical Journal, 284, 595.

Livingstone, E., Simpson, D., & Naismith, W. C. (1974). A comparison between catgut and polyglycolic acid sutures in episiotomy repair. The Journal of Obstetrics and Gynaecology of the British Commonwealth, 81, 245-247.

Llewellyn-Jones, D. (1971). Fundamentals of obstetrics and gynaecology: Volume One. Obstetrics. London: Faber and Faber.

Lumley, J. (1978). Sexual feelings in pregnancy and after childbirth. Australian and New Zealand Journal of Obstetrics and Gynaecology, 18, 114-117.

Mahomed, K., Grant, A., Ashurst, H., & James, D. (1989). The Southmead perineal suture study. A randomized comparison of suture materials and suturing techniques for repair of perineal trauma. British Journal of Obstetrics and Gynaecology, 96, 1272-1280.

Maxwell, C. (1978). Sensitivity and accuracy of the visual analogue scale: A psycho-physical classroom experiment. British Journal of Clinical Pharmacology, 6, 15-24.

McGuinness, M., Norr, K., & Nacion, K. (1991). Comparison between different perineal outcomes on tissue healing. Journal of Nurse-Midwifery, 36(3), 192-198.

Melzack, R. (1975). The McGill pain questionnaire: Major properties and scoring methods. Pain, 1, 277-299.

Melzack, R. (1987). The short-form McGill pain questionnaire. Pain, 30, 191-197.

Melzack, R., & Torgerson, W. S. (1971). On the language of pain. Anaesthesiology, 34(1), 50-59.

Monberg, J., & Hammen, S. (1987). Ruptured episiotomia resutured primarily. Acta Obsteticia et Gynecologica Scandinavica, 66(1), 163-164.

Montgomery, E. (1986). Pelvic power. Community Outlook, Sept, 33-34.

Mosby's medical and nursing dictionary (2nd ed.) (1986). St Louis: The C.V. Mosby Co.

Nodine, P. M., & Roberts, J. (1987). Factors associated with perineal outcome during childbirth. Journal of Nurse-Midwifery, 32(3), 123-130.

Newton, M., Mosey, L. M., Egli, G. E., Gifford, W. B., &
     Hull, C. T. (1961). Blood loss during and immediately
     after delivery. Obstetrics and Gynecology, 17(1), 9-18.

Nielsen, C. A., Sigsgaard, I., Olsen, M., Tolstrup, M.,
     Danneskiold-Samsoee, B., & Bock, J. E. (1988).
     Trainability of the pelvic floor. Acta Obstetricia et
     Gynecologica Scandinavica, 67, 437-440.

Ohnhaus, E. E., & Adler, R. (1975). Methodological problems
     in the measurement of pain: A comparison between the
     verbal rating scale and the visual analogue scale. Pain,
     1, 379-384.

Olah, K. S. (1990). Episiotomy repair - suture material and
     short term morbidity. Journal of Obstetrics and
     Gynaecology, 10, 503-505.

O'Leary, J. L., & O' Leary, J. A. (1965). The complete
     episiotomy. Obstetrics and Gynecology, 25, 235-240.

Orem, D. E. (1985). Nursing: Concepts of practice. New
     York: McGraw-Hill.

Oxorn, H. (1986). Oxorn-Foote: Human labor and birth
     (5th ed.). Norwalk, CT: Appleton-Century-Crofts.

Paciornik, M. (1990). Commentary: Arguments against
     episiotomy and in favor of squatting for birth. Birth,
     17, 104-105.

Paull, T., & Tedeschi, L. G. (1972). Perineal endometriosis
     at the site of episiotomy scar. Obstetrics and
     Gynecology, 40(1), 28-34.

Reading, A. E., Sledmere, C. M., Cox, D. N., & Campbell, S.
     (1982). How women view postepisiotomy pain. British
     Medical Journal, 284, 243-246.

Revill, S. I., Robinson, J. O., Rosen, M., & Hogg, M. I.
     (1976). The reliability of a linear analogue for
     evaluating pain. Anaesthesia, 31, 1191-1198.

Reynolds, J. L., & Yudkin, P. L. (1987). Changes in the management of labour: 2. Perineal management. Canadian Medical Association Journal, 136, 1045-1049.

Roberts, J. E., & Kriz, D. M. (1984). Delivery positions and perineal outcome. Journal of Nurse-Midwifery, 29, 186-190.

Roberts, A. D. G., & McKay Hart, D. (1983). Polyglycolic acid sutures, with and without oral proteolytic enzymes, in the healing of episiotomies. British Journal of Obstetrics and Gynaecology, 90, 650-653.

Robinson, J. O., Rosen, M., Evans, J. M., Revill, S. I., David, H., & Rees, G. A. (1980). Maternal opinion about analgesia for labour. Anaesthesia, 35, 1173-1181.

Rockner, G., Jonasson, A., & Olund, A. (1991). The effect of mediolateral episiotomy at delivery on pelvic floor muscle strength evaluated with vaginal cones. Acta Obstetricia et Gynecologica Scandinavica, 70, 51-54.

Rockner, G., & Olund, A. (1991). The use of episiotomy in primiparas in Sweden: A descriptive study with particular focus on two hospitals. Acta Obstetricia et Gynecologica Scandinavica, 70, 325-330.

Rockner, G., Wahlberg, V., & Olund, A. (1989). Episiotomy and perineal trauma during childbirth. Journal of Advanced Nursing, 14, 264-268.

Rogers, R. E. (1974). Evaluation of post-episiorrhaphy pain: Polyglycolic acid vs catgut sutures. Military Medicine, 139, 102-104.

Ruparelia, B. A., Robson, P., Iqbal, I., & Johnson, I. R. (1990). Use of povidine-iodine in post-delivery perineal repairs: A prospective trial. Journal of Obstetrics and Gynaecology, 10, 202-203.

Sampselle, C. M. (1990). Changes in pelvic muscle strength and stress urinary incontinence associated with childbirth. Journal of Obstetrical Gynecological and Neonatal Nursing, September/October, 371-377.

Scott, J., & Huskisson, E. C. (1976). Graphic representation of pain. Pain, 2, 175-184.

Sheriff, J. (1984). Think before you cut. Nursing Mirror, 158, ix-xii.

Shiono, P., Klebanoff, M. A., & Carey, J. C. (1990). Midline episiotomies: More harm than good?. Obstetrics and Gynecology, 75, 765-770.

Shy, K. K., & Eschenbach, D. A. (1979). Fatal perineal cellulitis from an episiotomy site. Obstetrics and Gynecology, 54, 292-298.

Sieber, E. H., & Kroon, J. D. (1962). Morbidity in the third-degree laceration. Obstetrics and Gynecology, 19, 677-680.

Sleep, J. (1991). Perineal care: A series of five randomized controlled trials. In S. Robinson, & A. M. Thompson (Eds.). Midwives, research and childbirth: Vol 2 (pp. 199-251). London: Chapman & Hall.

Sleep, J., Grant, A., Garcia, J., Elbourne, D., Spencer, J., & Chalmers, I. (1984). West Berkshire perineal management trial. British Medical Journal, 289, 587-590.

Sleep, J., & Grant, A. (1987). West Berkshire perineal management trial: Three year follow up. British Medical Journal, 295, 749-751.

Spencer, J. A. D., Grant, A., Elbourne, D., Garcia, J., & Sleep, J. (1986). A randomized comparison of glycerol-impregnated chromic catgut with untreated chromic catgut for the repair of perineal trauma. British Journal of Obstetrics and Gynaecology, 93, 426-430.

Stanton, S. L., Kerr-Wilson, R., & Grant Harris, V. (1980). The incidence of urological symptoms in normal pregnancy. British Journal of Obstetrics and Gynaecology, 87, 897-900.

Thacker, S. B., & Banta, H. D. (1983). Benefits and risks of episiotomy: An interpretative review of the English language literature, 1860 - 1980. Obstetrical and Gynecological Survey, 38, 322-338.

Thorp, J. M., Jr., Bowes, W. A., Jr., Brame, R. G., & Cefalo, R. (1987). Selected use of midline episiotomy: Effect on perineal trauma. Obstetrics and Gynecology, 70, 260-262.

Thorp, J. M., Jr., & Bowes, W. A., Jr. (1989). Episiotomy: Can its routine use be defended?. American Journal of Obstetrics and Gynecology, 160, 1027-1030.

Thranov, I., Kringelbach, A. M., Melchior, E., Olsen, O., & Damsgaard, M. T. (1990). Postpartum symptoms. Episiotomy or tear at vaginal delivery. Acta Obstetricia et Gynecologica Scandinavica, 69(1), 11-15.

Towler, J., & Butler-Manuel, R. (1980). Modern obstetrics for student midwives (2nd ed.). London: Lloyd-Luke.

Varney, H. (1987). Nurse-midwifery (2nd ed.). Boston: Blackwell Scientific.

Wells, T. J. (1990). Pelvic (floor) muscle exercise. Journal of the American Geriatrics Society, 38, 333-337.

Wilcox, L. S., Strobino, D. M., Baruffi, G., & Dellinger, W. S., Jr. (1989). Episiotomy and its role in the incidence of perineal lacerations in a maternity center and a tertiary hospital obstetric service. American Journal of Obstetrics and Gynecology, 160, 1047-1052.

Wilkerson, V. A. (1984). The use of episiotomy in normal delivery. Midwives Chronicle & Nursing Notes, 97, 106-110.

Willmott, J. (1980). Too many episiotomies. Midwives Chronicle & Nursing Notes, 93, 46-48.

Wood, C., Ng, K. H., Hounslow, D., & Benning, H. (1973). Time - an important variable in normal delivery. The Journal of Obstetrics and Gynaecology of the British Commonwealth, 80, 295-300.

Wynn, R. M. (1965). English translation of von Ritgen, F. (1855). Concerning his method for protection of the perineum. American Journal of Obstetrics and Gynecology, 93, 421-433.

LIST OF APPENDIXES

DEMOGRAPHIC/OBSTETRIC DATA QUESTIONNAIRE

Addressograph label   Code Nº [| | |]

---

(1) Patients age ......

(2) What was the duration of labour? 1st stage ..... 2nd stage .....

(3) What was the blood loss at delivery? ....mls

(4) What was the birthweight? ....gms

(5) What was the method of delivery?
Spontaneous [ ], Vacuum Extraction [ ], Breech [ ],
Forceps [ ] Type .... Mid / Low / Rotation.

(6) What was the type of perineal trauma?
None [ ], Episiotomy [ ], Tear [1°] [2°] [3°], Labial tear [ ]
Episiotomy plus tear [ ], Vaginal wall tear [ ].

(7) What was the reason for the episiotomy? (Please state)

....

(8) Was the episiotomy / tear?
Midline [ ], Mediolateral [ ], Other (specify) ....

(9) Who repaired the perineum? (If more than 1, tick more than 1)
Obstetrician [ ], Registrar [ ], Resident [ ], Midwife [ ].

(10) Were the skin sutures?
Subcuticular [ ], Transcutaneous [ ].

(11) What suturing method was used for the muscle layers?
Interrupted [ ], Continuous [ ].

(12) What type of suture material was used?
Catgut [ ], Vicryl [ ], Dexon [ ], Other (state) ....

(13) How many packets of suture material were opened? ....

(14) How long after birth was the perineum sutured?
Less than 30 minutes [ ], 30 minutes to 1 hour [ ],
Longer than 1 hour [ ] Reason for delay ....

(15) What analgesia did the patient have during labour?
N_2O & O_2 [ ], Pethidine [ ], Epidural [ ], Other [ ].

(16) What form of anaesthesia was used for suturing?
Lignocaine [ ], Epidural [ ], General [ ].

(17) Was this birth the;
First [ ], Second [ ], Third [ ], Fourth [ ], Or more ....

(18) Has the patient had an episiotomy or tear before?
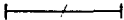Yes [ ], No [ ].

PERINEAL RESEARCH QUESTIONNAIRE

Please answer <u>all</u> questions by marking the line or by ticking the
appropriate answers. Remember there are no right or wrong answers.
It is your individual feeling that is important to this study.

Please answer the first four questions by making a mark on the line.
For example, if the start of the line is "no pain at all" and the
far end of the line is the "worst pain you can possibly imagine",
please make a mark on the line at a point that best shows how much
pain you have (e.g. ├────/────┤).

1. How painful was it being stitched after the birth of your baby?

    NO   PAIN AS
    PAIN   ├──┤ BAD AS
                                                           IT CAN
                                                           BE

2. How painful is your perineum today? (the area between your
    vaginal opening and your anal area)

    NO   PAIN AS
    PAIN   ├──┤ BAD AS
                                                           IT CAN
                                                           BE

3. Can you sit comfortably holding your baby today?

    NO   PAIN AS
    PAIN   ├──┤ BAD AS
                                                           IT CAN
                                                           BE

4. Can you walk comfortably today?

    NO   PAIN AS
    PAIN   ├──┤ BAD AS
                                                           IT CAN
                                                           BE

5. In your own words, how would you describe the pain or
    discomfort you are feeling? (please write)

    . . . .

6. Is your pain present <u>all</u> the time?   YES [   ], NO [   ].

7. If you have pain only <u>part</u> of the time, when is it?
    (you may tick more than one)

    [   ] walking

    [   ] sitting

    [   ] breastfeeding

    [   ] going to stand up

    [   ] going to the toilet

    [   ] other, (please write) . . . .

8. Do you still need any pain relieving methods for your perineum? (you may tick more than one)

   [ ] none
   [ ] tablets
   [ ] ice packs
   [ ] injections
   [ ] ultrasound
   [ ] other, (please write) ....

9. Do you have any pain when you pass urine? (tick one box only)

   [ ] no pain
   [ ] mild pain
   [ ] a lot of pain
   [ ] can't pass urine at all

10. Do you have any haemorrhoids (piles) ?

   [ ] yes
   [ ] no

11. If YES, are the haemorrhoids causing you more pain than your perineum? (tick one box only)

   [ ] yes
   [ ] no
   [ ] can't tell

12. Have you attended antenatal parent education classes in the past or during this pregnancy?

   [ ] yes
   [ ] no

13. Did you expect to have as much pain in your perineum?

   [ ] yes
   [ ] no

Thank you very much for your time and co-operation.

Code Nº [ ][ ][ ]

DAY 3

PERINEAL RESEARCH QUESTIONNAIRE

For completion by the midwife observer.

REEDA SCALE

1. REDNESS

   0 [　] None

   1 [　] Within .25 cm. of incision bilaterally

   2 [　] Within .5 cm. of incision bilaterally

   3 [　] Beyond .5 cm. of incision bilaterally

2. Edema

   0 [　] None

   1 [　] Perineal, less than 1 cm. from incision

   2 [　] Perineal and/or Vulvar, between 1 to 2 cm. from incision

   3 [　] Perineal and/or Vulvar, greater than 2 cm. from incision

3. ECCHYMOSIS (bruising)

   0 [　] None

   1 [　] Within .25 cm. bilaterally or .5 cm. unilaterally

   2 [　] Between .25 to 1 cm. bilaterally or between .5 to 2 cm. unilaterally

   3 [　] Greater than 1 cm. bilaterally or 2 cm. unilaterally

4. DISCHARGE

   0 [　] None

   1 [　] Serum

   2 [　] Serosanguinous

   3 [　] Bloody, purulent

5. APPROXIMATION

   0 [　] Closed

   1 [　] Skin separation 3 mm. or less

   2 [　] Skin and subcutaneous fat separation

   3 [　] Skin, subcutaneous fat and fascial layer separation
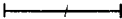
6. Have antibiotics been prescribed?

   [　] Yes

   [　] No

Appendix C

6 WEEKS

PERINEAL RESEARCH QUESTIONNAIRE

Please answer <u>all</u> questions by marking the line or by ticking the appropriate answers. Remember there are no right or wrong answers. It is your individual feeling that is important to this study.

Please answer questions 1 to 5, and 12 and 13 by making a mark on the line. For example, if the start of the line is "no pain at all" and the far end of the line is the "worst pain you can possibly imagine", please make a mark on the line at a point that best shows how much pain you have (e.g. ├───┼───┤).

1. What was the worst pain you felt in your perineum this week?

    NO
    PAIN ├──────────────────────────────────.──┤ PAIN AS
                                                   BAD AS
                                                   IT CAN
                                                   BE

2. How much pain do you have in your perineum when you sit down?

    NO
    PAIN ├─────────────────────────────────┤ PAIN AS
                                               BAD AS
                                               IT CAN
                                               BE

3. How much pain do you have in your perineum when you walk?

    NO
    PAIN ├────────────────────────────────┤ PAIN AS
                                              BAD AS
                                              IT CAN
                                              BE

4. How much pain do you have when you pass urine?

    NO
    PAIN ├────────────────────────────────┤ PAIN AS
                                              BAD AS
                                              IT CAN
                                              BE

5. How much pain do you have when you have your bowels open?

    NO
    PAIN ├────────────────────────────────┤ PAIN AS
                                              BAD AS
                                              IT CAN
                                              BE

6. What pain relieving methods have you taken or used for your perineum during this past week?

    (you may tick more than one)

    [ ] none
    [ ] ice packs
    [ ] tablets
    [ ] ultrasound
    [ ] other, (please write) ....

7. Have you had any problems with the healing of your perineum
    which you have needed to go to your doctor with?
    [ ] yes
    [ ] no

8. If YES, what was this problem/s?
    (you may tick more than one)
    [ ] pain
    [ ] infection
    [ ] delayed healing
    [ ] breakdown of stitches or wound
    [ ] other, (please write) ....

9. Have you needed to have your stitches taken out?   .
    [ ] yes
    [ ] no

10. Did your perineum need to be re-stitched?
    [ ] yes
    [ ] no

11. Have you resumed sexual intercourse?
    [ ] yes
    [ ] no

12. If YES, do you have any pain with sexual intercourse?

                                                        PAIN AS
        NO |——————————————————————————————| BAD AS
        PAIN | | IT CAN
                                                          BE

13. Did you have any pain with sexual intercourse before you
    became pregnant with this baby?

                                                        PAIN AS
        NO |——————————————————————————————| BAD AS
        PAIN | | IT CAN
                                                          BE

14. Are you breastfeeding your baby?
    [ ] yes
    [ ] no

    Thank you very much for your time and co-operation.

Code Nº [ ][ ][ ][ ]

3 MONTHS

PERINEAL RESEARCH QUESTIONNAIRE

Please answer <u>all</u> questions by marking the line or by ticking the appropriate answers. Remember there are no right or wrong answers. It is your individual feeling that is important to this study.

Please answer question 3 by making a mark on the line. For example, if the start of the line is "no pain at all" and the far end of the line is the "worst pain you can possibly imagine", please make a mark on the line at the point that best shows how much pain you have (e.g. ├──────┼────┤).

1. Did your perineum heal <u>without</u> any problems?

[ ] yes

[ ] no

2. If NO, what was this problem/s?

(you may tick more than one)

[ ] pain

[ ] infection

[ ] delayed healing

[ ] breakdown of stitches or wound

[ ] other, (please write) ....

3. What was the worst pain you felt in your perineum this week?

```
                                                      PAIN AS
  NO    ├──────────────────────────────────────────┤  BAD AS
  PAIN                                                  IT CAN
                                                        BE
```

4. If your perineum is still painful, is it?

(you may tick more than one)

[ ] sore when touched

[ ] when you are sitting

[ ] when you are passing urine

[ ] when you are having your bowels open

[ ] other, (please write) ....

5. Do you ever lose any urine when you don't mean to?

[ ] yes

[ ] no

6. If YES, do you need to wear a pad?
    (tick one box only)
    [ ] no
    [ ] sometimes
    [ ] always

7. Have you resumed sexual intercourse?
    [ ] yes
    [ ] no

8. If YES, has sexual intercourse become comfortable again?
    [ ] yes
    [ ] no

9. If YES, sexual intercourse has become comfortable, how many
    weeks after your delivery was this?
    (please write)
    ..... weeks

Thank you very much for your time and co-operation.

CONSENT FORM

Study Title : The Relationship Between Episiotomy and
              Perineal Lacerations and Perineal Pain
              Following Childbirth.

Investigator: Christine White. Clinical Nurse Specialist,
              Delivery Suite.

Mrs White is a midwife studying the physical discomforts
and problems some women have after the birth of their baby,
particularly if they have needed to have stitches in their
perineum. She believes the study will provide information
that will enable midwives to identify these problems and to
assist with preventing some of these problems from occurring.

Mrs White would welcome your help with this project.
It will involve filling in a questionnaire about three days
after you have had your baby, then two more questionnaires
will be posted to your home with an addressed, prepaid (no
stamp required) envelope also enclosed; at six weeks and
three months after your baby is born. The questionnaires
will mainly require you to tick or mark the appropriate
answers and should only take a few minutes to complete.
Your replies will be treated in strict confidence and to
ensure this confidentiality code numbers, rather than your
names, will be used on the forms.

I know that my participation in this study is strictly
voluntary. I know that I have the right to withdraw at any
time and that my care and my relationship with the health
care team will not be affected.

If I have any questions about the study or about being a
participant, I know I can call Mrs White. I may reach her on
3402177 (7am to 4pm, Monday to Friday) or 3883193 (home).

I agree to participate in this study, and I have
received a copy of the consent form.

_____   _____

     Date   Participant's Signature

_____   _____

    Witness   Investigator's Signature

KING EDWARD MEMORIAL HOSPITAL
FOR WOMEN

CC:nn

28 June 1991

Ms Christine White
Delivery Ward
King Edward Memorial Hospital   .
374 Bagot Road
SUBIACO WA 6008

Dear Ms White

RE: Research Proposal "The Relationship between Episiotomy and Perineal
Lacerations and Perineal pain following Childbirth".

I am pleased to advise that the above project has been approved by the
Board of Management.

Would you please advise the date of commencement of the project and
provide a copy of the findings at its conclusion or in 12 months,
whichever comes first? should there be a delay in commencement of more
than six months, the project would need to be reviewed by the Committee.

Best wishes with your project.

Yours sincerely

MARK PLATELL
Director of Medical Services

EDITH COWAN UNIVERSITY

PERTH WESTERN AUSTRALIA

Committee for the Conduct of Ethical Research

---

31 July 1991

Ms Christine J White
11 Munsie Avenue
DALGLISH WA 6008

Dear Christine

The Committee for the Conduct of Ethical Research having considered the ethical implications of your project is pleased to advise you that they are satisfied that all ethical issues have been properly addressed.

You are free to continue with your project.

Yours sincerely

Eric Graham
Executive Officer

cc Associate Professor Anne McMurray
   Mrs Lynette Kerr

KING EDWARD MEMORIAL HOSPITAL
FOR WOMEN

27 June 1991

Mrs Christine J White
11 Munsie Avenue
DAGLISH WA 6008

Dear Mrs White

RE: THE RELATIONSHIP BETWEEN EPISIOTOMY AND PERINEAL LACERATIONS AND
PERINEAL PAIN FOLLOWING CHILDBIRTH

I am pleased to advise that the above Research Proposal has been
approved by the Ethics Committee and endorsed by the Board of
Management. The study will be entered into the register of on-going
research.

You are reminded of the following conditions:-

      .   Progress reports may be requested.
      .   Any difficulties which threaten progress should be discussed
            with the Nursing Research Liaison Officer.
      .   It is your responsibility to inform the Nursing Research
            Liaison Officer when data collection in complete.
      .   At the conclusion of the study you must negotiate through
            the Director of Nursing for use of the Hospital name in
            research reports and conferences discussing the research.

The Nursing Executive extend their best wishes for your success in
this project and look forward to receiving a copy of the report at the
conclusion of the study.

Yours sincerely

PAT J MARTIN
DIRECTOR OF NURSING

don\research

KING EDWARD MEMORIAL HOSPITAL
FOR WOMEN

1 June 1991

Dear Colleague,

I am currently studying for my Master of Health Science
(Nursing). For my research study I have proposed to
investigate the short and long term effects of perineal
trauma. Specifically, I wish to examine the relationship
between the extent of perineal trauma and the severity and
duration of perineal pain during the first three months
following delivery. Questionnaires will be given/posted
to all women, undergoing perineal repair, on day 3, at 6
weeks and at 3 months postpartum. The study will be
conducted for six months, from July to December 1991.

I would appreciate your help with this project by completing
the initial information questionnaire, for each woman
requiring perineal repair, after the suturing is completed.

In anticipation, thank you for your help.

   urs sincerely,

Christine White
Clinical Nurse Specialist
Delivery Ward

KING EDWARD MEMORIAL HOSPITAL
FOR WOMEN

Dear

Congratulations on the birth of your baby!

Now that you have had your baby I would very much like to
know about the pain, discomfort or problems you are
experiencing particularly with your perineum.

The attached questionnaire, once completed by you will
help us to assess some aspects of maternity care that'may
be improved.

Your replies will be treated in strict confidence and to
ensure this confidentiality code numbers, rather than your
names, are being used on the forms. It is only by gathering
together your answers that we will be able to gain a true
picture of the discomfort and/or the problems women
experience after they have had a baby.

In anticipation, I should like to thank you for your help.

Yours sincerely,

Christine White

Clinical Nurse Specialist
Delivery Ward

Attached: Form N⁰ 1

KING EDWARD MEMORIAL HOSPITAL
FOR WOMEN

Dear

Thank you very much for filling in the last questionnaire
six weeks ago. Your answers to this are already being
analysed.

Please find enclosed the second questionnaire I would like
you to fill in. As with the last questionnaire, this form
is coded so that the answers you give will be treated
strictly confidential.

I very much need to know about any discomfort you may still
be experiencing, or any other problems related to your
perineum. Enclosed is an addressed, prepaid (no stamp
required) envelope for you to return your completed
questionnaire.

I hope that you will also benefit from this project and
again thank you for all your help.

Yours sincerely,

Christine White

Clinical Nurse Specialist
Delivery Ward

Enclosed: Form N° 2.

KING EDWARD MEMORIAL HOSPITAL
FOR WOMEN

Dear

Thank you very much for filling in the last two questionnaires.
Your answers to these are already being analysed.

Enclosed is the third and final form which I would very
much like you to fill in. Once returned, this will help
me to complete my research record and in this way we hope
to improve the maternity care given. As with the two
previous questionnaires, all the information you give will
be treated in strict confidence.

It is important for me to know if you are having any
problems related to your perineum at this stage. I would
be most grateful if you would take a couple of minutes to
answer the questions on the enclosed form, and to return
them in the addressed, prepaid (no stamp required) envelope
also enclosed.

I hope that you will also benefit from this project, and
again thank you for all your help.

Yours sincerely,

Christine White

Clinical Nurse Specialist
Delivery Ward

Enclosed: Form Nº 3.