Childbirth and the Development of Post-Traumatic Stress Symptoms: An Examination of Prevalence and Possible Contributing Factors

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ABSTRACT

Prior to the reformulation of diagnostic criteria in the Diagnostic and Statistical Manual – Forth Edition (DSM-IV), it was widely believed that in order to qualify for a diagnosis of post-traumatic stress disorder (PTSD) one had to experience a trauma that was outside the range of normal human experience. However, a growing body of research informed a shift in criteria to include subjective factors in the diagnosis of the disorder. Therefore, it was not the event itself that predicted the development of PTSD, rather a person's reaction to it. Following this shift in thinking it became accepted that women could develop PTSD following childbirth.

The aim of the present study was to examine the prevalence of post-traumatic stress symptoms in women one month and three months after giving birth in a NHS hospital in Scotland. In addition a number of potential predictive variables were considered in relation to the development of PTSD symptoms. They included the number of obstetric interventions experienced by women; locus of control; number of perinatal life events experienced; baby's admission to the Special Care Baby Unit; and co-morbid anxiety and depression in the postpartum period.

Sixty-one mothers completed measures assessing PTSD symptomatology and predictive variables one month following delivery. Fifty-two mothers responded three months following delivery.

Results revealed that 14.8% of women experienced symptoms suggestive of post-traumatic stress disorder one month after giving birth. This figure fell to 9.6% three

months after birth. The number of obstetric interventions experienced, locus of control or life events which occurred prior to labour and delivery were not related to the development of symptoms. Events which occurred during labour and delivery significantly differentiated women with more PTSD symptoms at one month but not at three months post-delivery. Events which occurred after delivery significantly differentiated women with PTSD symptoms from those without PTSD symptoms at one month and three months postpartum. Mothers whose infants were admitted to the special care baby unit had more symptoms of PTSD than those whose infants were not, at one month, but not three months, following delivery. Finally, women who had higher scores for PTSD had significantly higher anxiety and depression scores at one month post-delivery. Only anxiety scores remained significant at three months post-delivery.

The results are discussed in relation to previous research in the area of postpartum PTSD and the limitations of the study and implications for future research are considered.

CHAPTER ONE

INTRODUCTION

1.1 History of Post-Traumatic Stress Disorder

Symptoms of post-traumatic stress disorder have been written about for centuries. It has been described as 'Railway Spine', 'Irritable Heart' and 'Nervous Shock'. Shell Shock is probably the most well known of these terms and it referred to the belief that combat-related disorder was caused by tiny brain haemorrhages which resulted from the lodging of shrapnel in the brain during explosions. However, observations that soldiers could develop symptoms of shell shock in the absence of any explosions led to the belief that shell shock was the result of a weak character. Consequently many soldiers during the First World War, who today would have been diagnosed with post-traumatic stress disorder, were executed for cowardice (Joseph et al, 1997).

Further descriptions of post-traumatic reactions emerged during the Second World War. Symptoms of 'post-trauma-syndrome' included increased feelings of irritability, outbursts of anger, fixation on the trauma, disturbed dreams and disrupted personality functioning. Around the same time, similar reactions were being described in civilian survivors of traumatic events, such as floods, fires and cyclones (Joseph et al, 1997). However, it was not until 1980, with the emergence of large numbers of veterans of the Vietnam War, all showing similar symptoms and self-medicating on alcohol and drugs, that post-traumatic stress disorder was officially recognised as following on from a

traumatic event, and described in DSM-III (American Psychiatric Association) under the general heading of Anxiety Disorders (Crompton, 2002).

Early criteria restricted the disorder to objectively unusual or severe events. The DSM-III-R specified that the event had to be 'outside the normal range of experience', and the International Classification of Diseases (10th revision) of the World Health Organisation stated that the event must be 'likely to cause pervasive distress in almost anyone' However, over the years it became apparent that post-traumatic stress disorder-like symptoms could occur in individuals who were not involved in an unusual event such as an earthquake or a mass murder. Symptoms were increasingly being reported after events as varied as road traffic accidents, myocardial infarction, rape, assault or child abuse. Indeed, secondary post-traumatic stress disorder has been reported in individuals close to those involved in traumatic events, such as learning about the traumatic death of a loved one (Ayers & Pickering, 2001).

In 1994, DSM-IV changed the event criterion to recognise that an individual's perception of the threat and response to an event critically affect the subsequent development of post-traumatic stress disorder. Therefore, a less unusual event can result in the disorder if an individual believed that his or her life was threatened (Ayers & Pickering).

1.2 Architecture of Post-Traumatic Stress Disorder

The diagnostic criteria of post-traumatic stress disorder put forward by those preparing the DSM-III was influenced by Horowitz's (1975) work on the phenomenology of

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trauma-related reactions. Horowitz developed an information processing model based on the assumption that individuals have mental models, or schemata, of the world and of themselves which they use to interpret incoming information. A traumatic event presents information that is incompatible with existing schemata and this invokes a stress response in the individual, requiring them to reappraise and revise existing schema. This manifests itself in the person exposed to the traumatic event being bombarded with intrusive and emotionally disturbing memories of the trauma as the cognitive processing of the event takes place. In response to this, the individual uses avoidance strategies in order to protect themselves form the disturbing thoughts, images and feelings associated with the trauma. Avoidance strategies serve to regulate the incoming information in tolerable doses in order to prevent emotional burn-out. According to Horowitz (in Joseph et al, 1997) intrusion and avoidance states oscillate until memories of the trauma have been processed and the individual is said to have 'worked through' the trauma. Unremitting symptoms of avoidance and intrusion occur when a blockage has occurred at the information processing level and the individual has failed to assimilate the traumatic event.

In the DSM-III and in subsequent revisions of the DSM, a third group of symptoms were described under the heading of hyperarousal. These symptoms included difficulty falling or staying asleep and difficulty concentrating. Horowitz had included these symptoms in his two factor model under the headings of intrusions and denials respectively. A summary of the current diagnostic criteria for PTSD as set out in DSM-IV can be found in Appendix 1.

PTSD can be acute (four weeks to three months after the event), chronic (longer than three months after the event) or delayed onset (showing first symptoms six months after the event).

Since 1980 there has been a great deal of research into the psychological effects of traumatic events, however, the architecture of post-traumatic stress reactions is far from clear. Although the classification of PTSD has provided a common language for researchers and clinicians alike, there remains debate over whether or not there is a generic PTSD, or whether the structure of post-traumatic reactions is dependent on the type of traumatic event. It has been suggested that the term PTSD should be qualified as in rape-related PTSD, combat related PTSD, etc. (Joseph et al, 1997).

1.3. Prevalence of Post-Traumatic Stress Disorder

For those at risk, such as combat veterans, the rates of PTSD range from 3.5% among uninjured veterans to 65% among veterans who had been prisoners of war. Studies in the US suggest a prevalence rate of approximately 1% in the general population, although prevalence may vary depending on the population studied (Reynolds, 1997). In one study it was found to be as high as 7.8% (Kessler et al, 1995). A few studies have looked at sex differences in the prevalence of PTSD in the general population. US rates of PTSD were 5 per 1000 among men and 13 per 1000 among women. Whereas combat exposure was the most common triggering event for men, physical attack (including rape) and threats were the most common events for women (Reynolds, 1997)

1.4. Mediating and Modulating Factors in the Development of Post-Traumatic Stress Disorder

In the past, post-traumatic stress disorder has been described as a normal reaction to an abnormal event. However, since not everyone who is exposed to a traumatic event goes on to develop clinical PTSD, and since research has demonstrated that the event which triggers PTSD does not have to be outside the range of normal experience, this statement cannot be held true. As a result research has focused on pinpointing variables that may contribute to the development and maintenance of the disorder. Joseph et al (1997) consider a number of such factors within their integrative model of adjustment to trauma. They are outlined below.

1.4.1 Appraisal Factors:

Joseph et al (1997) argue that appraisal processes mediate between the traumatic event and subsequent adjustment. Appraisal processes can constitute a type of intrusive experience that is potentially under conscious control. They give the example of automatic thoughts such as 'I should have acted differently'. The individual can then explore the thought and respond to it in a variety of ways, for example attempting to resolve the question such as 'But could I really have done anything differently under the circumstances?' In this way, depending on the content of the ruminative activity, it might promote or impede the processing of the event.

1.4.2 Attributional Perspectives:

One of the processes involved in adaptation following a traumatic event is causal attribution. When individuals are faced with unpredictable and uncontrollable events they are strongly motivated to explain why the event occurred. According to Joseph et al (1997) attribution theorists believe that different explanations of why an event took place lead to different ways of coping with an event and different emotional states. For example the hopelessness theory of depression stipulates that following a negative event, individuals who make causal attributions to the event's occurrence to stable factors (i.e. the cause is perceived as something that persists across time) and global factors (i.e. the cause is perceived as something that affects a wide range of outcomes in the individual's life), may lead to the formation of beliefs that bad things will continue to happen. Feelings of hopelessness have been observed to underpin a variety of mental health problems. Joseph et al (1997) argue that hopelessness theory might be an appropriate model for predicting at least some of the clinical characteristics of PTSD.

In addition to the above, making causal attributions that other people are to blame for an event may also be associated with poorer outcomes. This is because blaming others may lead to emotional states of rage and anger, which could lead to the development and maintenance of PTSD (Joseph et al, 1997).

Individuals who make many internal and controllable attributions, such as 'I couldn't figure out how to work the fire extinguisher and that is why the fire spread' tend not to adapt as well following a traumatic event compared to those who make more external

and uncontrollable attributions, such as 'I couldn't climb the rope because there were no knots in it and it was very slippy.' Internal and controllable causal attributions for negative outcomes tend to be related to feelings of guilt, which in turn may exasperate PTSD symptoms. Perceptions of unexercised control may be particularly pertinent to the exasperation of PTSD symptoms.

1.4.3 Locus of Control:

A related concept to attributional style is that of locus of control. Joseph et al argue that although there is as yet no explicit evidence linking locus of control as a vulnerability factor for disorder following traumatic events, it has generally been accepted that perceptions of control are adaptive in stressful situations. For example in cancer patients the belief that one has control over one's illness is associated with positive adjustment. There is also evidence to suggest that perceptions of control are associated with lower distress in combat veterans. However, this association may not be as straightforward as it would seem. It is unclear how individuals with very high internal loci of control might respond if confronted with uncontrollable events that shatter their strongly held belief that they could exert control over a situation.

1.4.5 Personality Factors:

Research is generally consistent in its findings that prior behavioural and psychological problems are associated with greater distress following a traumatic event. Having a previous psychiatric history is recognised as a vulnerability factor for PTSD (Joseph et al, 1997).

1.4.6 Attitudes and Beliefs:

Rigid and absolute black and white attitudes and beliefs may play a role in the development and maintenance of PTSD. For example, an individual with a strongly held belief that one should always keep one's emotions under control is less likely to talk about their experiences or seek support from others following a traumatic event, thereby blocking the processing of emotionally charged information (Joseph et al, 1997).

1.4.7 Social Support:

A great deal of evidence exists which demonstrates the stress-buffering effects of social support (Joseph et al, 1997). The more social support an individual has the better chance they have of making a good psychological recovery following a traumatic event. This may be associated with the increased opportunity to emotionally process the event through talking to friends and family.

1.4.8 Coping Style:

Scott & Stradling (1995) point to coping style as perhaps the most promising predictor of trauma response. They distinguish between two forms of coping: (i) active, that is, direct confrontation of the stress, such as, beginning to clear up ones house after a flood, and (ii) palliative, that is, doing something to make one feel better, such as, drinking alcohol or taking a holiday. It would seem that the most adaptive long-term response to a trauma is likely to be an interweaving of problem-focused and emotion-

focused coping which will match the internal and external cues experienced by the individual (Scot and Stradling, 1997). Although avoidance reduces stress in the short term, in the long term it will prevent the individual from working through their experience and will prevent habituation to stressful stimuli, thereby serving to maintain symptoms.

1.5. Long Term Effects of Post-Traumatic Stress Disorder

If left untreated, PTSD can have a deleterious affect on individuals. PTSD has been associated with increased physical morbidity, subsequent psychiatric illness, accidental and non-accidental death (Crompton, 2002). It is generally accepted that chronic stress is related to physical problems such as stomach ulcers, ischemic heart disease, cancer and susceptibility to infections. Depression and anxiety are common co-morbid conditions and there is an increased incidence of alcohol and drug abuse among PTSD sufferers. In addition the impact on social, occupational and family functioning may be significantly impaired (Crompton, 2002).

1.6. Post-Traumatic Stress Disorder Following Childbirth.

Most health care professionals tend to think of birth trauma in terms of physical injury. However, childbirth can be psychologically traumatic as well. In a paper discussing the phenomenon of traumatic birth, Reynolds (1997) included the following excerpt from a statement made by a woman of her experience of childbirth:

'I could see everything in the mirror: the forceps, the episiotomy, my whole body being laid open. Somehow I wasn't there. I seemed to be floating around in the ceiling. It just really wasn't happening to me'

In 1978 Bydlowski and Raoul-Duval reported *la nevrose traumatique post-obsetetricale* after long difficult births or births in which the infant was damaged or stillborn (Ayers & Pickering, 2001). There are various examples to be found in the childbirth literature describing woman who experienced nightmares about birth, often years after they had actually given birth, and reports that women specify memories of labour and delivery as the second most disruptive factor postpartum (worries about the health of their baby were rated as most disruptive) (Ayers & Pickering, 2001). This suggests that childbirth can be a traumatic event with lasting psychological sequelae. However, it has only been relatively recently that post-traumatic stress disorder has been explicitly linked with childbirth. Prior to the changes made to the diagnostic criteria in the DSM-IV in 1994 women could not be diagnosed, and therefore treated for PTSD as they did not fulfil the criterion of having experienced an event outside the range of usual human experience. This was because researchers considered labour to be a usual event. However, there are those who argue that labour, however straightforward, is not 'usual' to women experiencing it; it is a momentous event by any standard. For some women labour is a frightening and painful experience and fear for their own or their baby's life may be very real (Ralph & Alexander, 1994). However, the reformulation of DSM criteria, stipulating that it was not the magnitude of the traumatic event itself that predicted the subsequent development of PTSD, rather it was the reaction to it, meant that women could now be diagnosed and therefore treated for postpartum PTSD.

Ballard et al (1995) described four cases with a symptom profile suggestive of PTSD commencing within 48 hours of childbirth. In all four cases the PTSD was associated with the delivery, one because the baby suffered cardiac arrest, one because of anaesthetic failure and two because of poor pain control. PTSD symptoms were frequent and persistent. Symptom resolution had not occurred in any of the subjects, and in three of the four cases symptoms had persisted for at least a year. In all four cases there was an associated depressive illness. Although Ballard et al could not comment on possible causes of the PTSD symptoms due to the small number of patients, they said that a long or complicated labour with the feeling of 'lack of control' were described as being important by each patient.

Fones (1996) presented a case report which served to highlight the possible predisposing risk factors and potential sequelae of childbirth related PTSD. He described Mrs T., a 40-year-old Chinese woman, who first presented to her general practitioner requesting tubal ligation. She had been suffering from recurrent recollections and nightmares of childbirth that first manifested themselves nine years earlier, after the birth of her son. She had endured 16 hours of labour, which she described as 'a long horrifying torture'. Epidural anaesthesia had not been administered and Entonox had been ineffective. In the end she had a forceps-assisted delivery. Her baby was well at birth and had no subsequent complications. Mrs T. experienced considerable perineal pain following the delivery. She was depressed for a month postpartum, had difficulty sleeping and was irritable. A week after delivery she began to have recurrent intrusive recollections of her labour accompanied by anxiety or panic symptoms. She sometimes had dreams of dying during childbirth. She had no hope for the future and had become increasingly cold towards her husband, although

her relationship with her son developed well. She could not bear to have intercourse for a year after the birth and when she resumed sexual relations with her husband she was petrified of becoming pregnant again. Mrs T. was aware that her sexual difficulties were a result of her fear of becoming pregnant, hence her request for tubal ligation. Following the operation Mrs T's sexual difficulties and anxiety improved and after three months she no longer had symptoms of PTSD.

Powell Kennedy and MacDonald (2002) described the case of a multiparous immigrant woman who, following a troublesome second stage of labour suddenly became unresponsive after the birth of her baby. She remained in a state of 'altered consciousness', most likely a dissociative experience, for approximately 25 minutes after the birth. They argue that such states of altered consciousness following childbirth may indicate post-traumatic stress disorder.

1.7. Conceptual Issues Regarding PTSD following Childbirth

When considering PTSD following childbirth Ayers (2003) argues that it is important to recognise the distinction between perceiving birth as traumatic (appraisal), a traumatic stress response (initial symptoms of intrusion and avoidance) and clinical PTSD. She points out that studies have shown that although women who had instrumental deliveries perceived the birth as more distressing, they did not have more symptoms of PTSD. She also cautions against pathologizing the traumatic stress response since the majority of women with these symptoms are likely to spontaneously resolve them in the first few weeks after birth.

1.8. Clinical Presentation of PTSD Symptoms Following Traumatic Birth

Bailham and Joseph (2003) outline some of the particular features of the clinical presentation of birth related PTSD in their review of the literature on the subject. They argue that there is emerging evidence which supports the notion that there are at least some idiosyncratic features in the presentation of PTSD in women following traumatic childbirth. This lends support to the idea that there are specific types of PTSD as opposed to a generic PTSD. Some of these features are outlined below:

Sexual avoidance and fear of childbirth:

Bailham and Joseph (2003) cites the case of a woman who could not resume sexual intercourse or any form of sexual activity with her partner because doing so resulted in her re-living and re-experiencing the pain and distress she experienced during her traumatic labour.

In addition to the above, many women request planned caesarean sections in an attempt to prevent being re-traumatised by another birth. Tokophobia is now recognised as a morbid fear of childbirth and in some cases can be so severe that some women believed they had no choice but to terminate much wanted pregnancies because they were unable to deal with the idea of another delivery (Goldbeck-Wood, 1996). Women's fears about childbirth also steam from lack of trust of obstetric staff, fears of their own incompetence, fear of their own death or the death of their infant, a fear of pain and loss of control (Bailham and Joseph, 2003). In addition, many women may

fear and avoid hospitals and/or health care professionals following a traumatic birth (Charles, 1997).

Mother-infant attachment and parenting problems:

Although research in this area is sparse, it is believed that attachment difficulties may be a frequent occurrence in women who develop PTSD following childbirth (Bailham and Joseph, 2003). Mothers may find it difficult to breastfeed and bond with infants who were delivered under traumatic circumstances. It may be that the infant serves as a trigger for intrusive thoughts and feelings about the birth. Under these circumstances women may feel the need to avoid their offspring and in extreme cases this could lead to maternal neglect (Charles, 1997).

1.9. Prevalence of PTSD Following Childbirth

A number of studies have attempted to estimate the prevalence of PTSD following childbirth. Menage (1993) studied 500 consecutive woman volunteers and found that 1 in 5 reported having found an obstetric or gynaecological procedure 'very distressing' or 'terrifying'. Of the women studied, 30 (6%) met DSM-IV criteria for PTSD as assessed using the PTSD-1 questionnaire. However, subjects in this study were highly self selected in that they responded to advertisements in newspapers and magazines and so it is not certain that these findings generalise to a wider population

Czarnocka and Slade (2000) assessed 264 women who had normal (spontaneous vaginal) births within 72 hours of giving birth on potential predictive measurements and again 6 weeks postpartum for levels of symptoms of intrusions, avoidance and hyperarousal using the Post-traumatic Stress Disorder Questionnaire (PTSD-Q). They found that 3% of the sample showed significant levels on all three dimensions of the PTSD-Q. A further quarter of the sample showed significant symptoms on at least one dimension. Based on their findings and given that there are approximately 700,000 births annually in England and Wales, the authors projected that around 21,000 women a year will have significant post-traumatic symptoms at 6 weeks postpartum. They also found that 75% of the fully symptomatic women also showed concurrent depressive symptoms, as indicated by the cut-off on the Edinburgh Postnatal Depression Scale.

Wijma et al (1997) conducted a cross sectional study using an unselected sample of 1640 women, all of whom had given birth over a 1-year period in Sweden. They utilised the Traumatic Events Scale, which is based on DSM-IV diagnostic criteria to measure the PTSD profile. They found that 1.7% of their sample was classified as having a PTSD profile related to childbirth.

Creedy et al (2000) studied 592 women who had given birth in Brisbane, Australia. Participants were contacted by telephone four to six weeks after delivery and PTSD symptoms were assessed using the Post-traumatic Stress Symptoms interview (PSS). Twenty-eight women (5.6%) met DSM-IV criteria for acute post-traumatic stress disorder. A further one in three women (33%) identified a traumatic birthing event and reported the presence of at least three trauma symptoms.

Soet et al (2003) examined the rates at which 103 women experienced psychological trauma in childbirth four weeks after giving birth. The Traumatic Events Scale was used to measure rates of PTSD. Childbirth was reported as traumatic by 34% of participants. Two women (1.9%) developed all the symptoms necessary to diagnose PTSD and 31 women (30.1%) were partially symptomatic.

Ayers and Pickering (2001) carried out a study which aimed to control for PTSD during pregnancy in order to obtain a clearer picture of what proportion of women develop the disorder as a result of childbirth. 289 women were assessed at three time points: 36 weeks gestation, and 6 weeks and 6 months postpartum. PTSD in pregnancy was measured using the MMPI-2-Post-traumatic Stress Disorder Scale and postpartum using the Post-traumatic Stress Disorder Symptom Scale (PSS). Incidence was examined after removing women who had severe symptoms of PTSD or clinical depression in pregnancy. 2.8% of women fulfilled criteria for PTSD at 6 weeks postpartum. However, this number fell to 1.5% at 6 months postpartum.

1.10. Predictors of PTSD Following Childbirth

Given the psychological complexity of birth and the birth environment many variables exist that may contribute to the development of post-traumatic stress symptoms following childbirth. A review of the literature has identified a number of studies examining possible contributing factors. These factors are outlined below.

1.10.1: Support

The importance of social support during pregnancy and birth cannot be underestimated. Intervention studies in which women have been offered social support at this time have typically found that it has many positive effects including fewer admissions to hospital during pregnancy, shorter labours, greater awareness during delivery, less use of neonatal intensive care by babies, greater health service use by mothers and babies after birth and improved psychological well-being, especially a reduction in anxiety (Oakley et al, 1990). It is not surprising that much of the literature examining predictors of postpartum post-traumatic symptoms have found that lack of social support is an important predictor variable.

Czarnocka and Slade (2002) found that the absence of a partner during labour and delivery was associated with post-traumatic type symptoms in women postpartum. The authors put forward a number of suggestions why this may be so. Partners have been shown to facilitate coping strategies in labouring women and so their absence may adversely affect coping in labour. This finding was supported by the fact that those with symptoms of PTSD postpartum differed significantly from non-symptomatic women in that they felt less confident in their ability to cope during labour and delivery. Secondly, the partner being absent may reduce the opportunity the woman has for discussing the labour and delivery after it has taken place with someone who witnessed the event, thereby reducing the opportunity to process and work through any negative emotions concerning the event. Czarnocka and Slade also found that the frequency of pregnancy being unplanned was more common amongst the symptomatic groups compared to the non-symptomatic group. This may have adversely influenced

the partner's attitude to the pregnancy, hence he may be less likely to want to attend the delivery. Finally, the authors suggested that the partners' absence from the delivery may indicate pre-existing problems within the relationship, which may in itself be distressing.

The fully symptomatic group in Czarnocka and Slade's study rated their attending partner / relative and staff as being less supportive. The partially symptomatic group tended to attach more blame to themselves and the staff for difficulties they experienced during labour and delivery, whereas the fully symptomatic group showed only elevated blame to staff. This is consistent with Joseph et al's (1997) finding that blaming others following a traumatic event may cause emotional states of anger and rage, which serve to cause or maintain PTSD symptoms. Wijma et al (1997) also found that having a negative appraisal of delivery staff and of the delivery itself predicted the presence of PTSD symptoms postpartum.

Soet et al (2003) measured women's perceptions of social support during pregnancy using the Medical Outcomes Study Social Support Survey. This inventory measured how many people the woman had available for social support and how often certain types of support were available. They found that perceived lack of social support during pregnancy was related to having PTSD symptoms postpartum, and they argued that this probably reflected aspects of the woman's recovery environment. Creedy et al (2000) also found that perception of partner support was significantly related to acute trauma symptoms postpartum.

1.10.2: Obstetric Variables

According to Fisher et al (1997), obstetric interventions evolved in response to particular clinical needs, such as assisting difficult births. However, Fisher et al argue that their use has risen significantly in the developed world over the last three decades, without adequate establishment of benefits or exploration of hazards in randomised controlled trails. There are many who extol the benefits of these procedures, but Fisher et al caution that many are also associated with more discomfort, and worse, a greater risk of damage to mother or baby. They point out that rates of maternal mortality are between two and four times higher and physical morbidity is both more prevalent and more severe following a caesarean section than vaginal delivery. Inconsistent evidence is emerging that obstetric procedures may have adverse psychological effects. Fisher et al argue that the most consistent findings have come from studies which have specifically examined mode of delivery, and they have found that significantly more caesarean-delivered women report feelings of loss, grief, depression and anxiety in the postpartum period compared to those who gave birth vaginally. In their study, Fisher et al aimed to investigate the psychological sequelae of obstetric procedures in 272 primiparous women. They found little evidence to support the notion that the total number of obstetric interventions was linked to a deterioration in postpartum mood, rather, significant adverse psychological effects were associated with the mode of delivery. Women who had an unassisted vaginal delivery, even after prolonged labour, were most likely to experience an improvement in mood and an elevation in self-esteem from late pregnancy to the early postpartum period. An instrumental delivery diminished the magnitude of this improvement in mood, and a caesarean delivery was associated with a significant increase of symptoms of depression and hostility,

diminished clarity of thinking, efficiency and enthusiasm, and a marked decrease in self esteem.

Soderquist et al (2002) used a sample of 1550 mew mothers in order to investigate a possible relationship between traumatic stress symptoms and obstetric variables. Obstetric data were manually collected from the medical records. They found that PTSD symptom profiles were more common in women who had an emergency caesarean section or an instrumental vaginal delivery, compared to women who had an elective caesarean section or a normal vaginal delivery. However, numerically more women who had a normal vaginal delivery were found in the PTSD symptom profile group. Relatively more of these women had a history of psychological/psychiatric counselling. The authors concluded that it could be that less severe events might lead to PTSD when a patient is more vulnerable, and that a vaginal delivery could be perceived as being traumatic, just as an emergency caesarean section is not necessarily perceived as being traumatic. This is in accordance with the conclusions of Tatano Beck (2004) who stated that 'birth trauma lies in the eye of the beholder'.

Ryding et al (1998, (1)) compared the psychological reactions of women after emergency caesarean sections (n = 71), elective caesarean sections (n = 70), instrumental vaginal deliveries (n = 89) and normal vaginal deliveries (n = 96). Participants were assessed a few days postpartum and again one month postpartum. Ryding et al hypothesised that because of the unexpected and uncontrollable nature of an emergency caesarean section, these women would experience more post-traumatic stress reactions, report more mental distress and a more negative cognitive appraisal of their delivery compared to the other three groups. Results showed that the emergency

caesarean section group did experience more mental distress a few days after delivery compared to the normal vaginal delivery group, but not compared to the other two groups. They found that the women who delivered by emergency caesarean section had the most negative cognitions and emotions regarding their delivery at both times. They also found that women who experienced instrumental vaginal deliveries had the second most negative cognitive appraisal of the delivery and were otherwise comparable with the emergency caesarean section group one month after delivery.

Ryding et al (1998, (2)) described the thoughts and feelings of 53 women during the process of a delivery that ended in an emergency caesarean section to ascertain if an emergency caesarean might fulfil the stressor criterion of post-traumatic stress disorder according to the DSM-IV. They used a time-spatial model to do so. They found that 55% of the women experienced intense fear, either for their own lives, or for the lives of their baby. The general reactions of the women were ones of security and confidence when arriving at the delivery ward. Their thoughts focused positively on the delivery ahead. They were initially relieved when they realised that they would have to deliver by emergency caesarean section because the knew that the pain would soon end, but they became fearful when lying on the operating table. On waking up mothers were pleased to see their new baby. Ryding et al concluded that an emergency caesarean section met the stressor criterion for DSM-IV diagnosis of PTSD, and that even if the new mother was happy to see her baby after an emergency caesarean, feelings of fear, anger or guilt may dominate the memory of the birth.

Ryding et al (1998, (3)) investigated predisposing psychological factors for post-traumatic intrusive stress reactions after emergency caesarean section in 24 women.

They found that having a negative past experience of delivery, feelings of being wronged by the delivery staff and a poor relationship with the partner predicted post-traumatic intrusive stress reactions in women.

Kirchmeier (1986) stated that it appears that the more time a woman has to prepare herself for a caesarean section, the more positive she will feel about her experience. She argues that healthcare professionals need to be aware of the increased complexity of feelings experienced by women who have had caesarean sections in order to be able to help and support them successfully.

Keogh et al (2002) correlated birth experiences, obstetric events and PTSD symptoms in women following childbirth. PTSD was measured using the Impact of Events Scale and the self-report version of the PTSD Symptom Scale (PSS-SR). They found that women who delivered by elective caesarean section were found to have higher prenatal anxiety sensitivity scores and higher postnatal PTSD scores than those who had an emergency caesarean section and those who had a vaginal delivery. They put forward a number of possible explanations for this including, fear of childbirth, difficult social circumstances, high-risk pregnancy or a previous difficult delivery.

Soet et al (2003) used the Medical Intervention Scale to assess level of obstetric intervention during labour and delivery. Scores were taken of medical intervention during first, second and third stages of labour and immediately postpartum. Using logistic regression they predicted that having a caesarean section and experiencing more pain in the first stage of labour significantly predicted PTSD symptoms four weeks after the birth.

Creedy et al (2000) contacted 499 women 4 to 6 weeks postpartum. Telephone interviews were conducted to explore the medical and midwifery management of the birth and presence of trauma symptoms. Using regression analysis they found that the level of obstetric intervention was a strong predictor of acute trauma symptoms. Emergency caesarean section, forceps delivery and extent of postpartum analgesia were particularly correlated with trauma symptoms. Vacuum extraction and concern for the baby's life were also statistically significant but less consistent than the other obstetric events. The authors argue that research into trauma and obstetric intervention tends to focus on the impact of emergency caesarean sections, whereas the traumatic nature of both forceps and vacuum deliveries is rarely considered. They point out that instrument assisted deliveries are emergency procedures, often in response to identified foetal distress and may be perceived as traumatic despite analgesia. Therefore fear for the baby's life and/or the physical trauma of an instrumental delivery may contribute to post-traumatic distress.

In a study examining incidence of PTSD following childbirth and an examination of predictive variables Czarnocka and Slade (2002) found that those with postpartum PTSD symptoms were more likely to have had an episiotomy during childbirth However, there were no differences found between those with PTSD symptoms and those without for nature of onset of labour, use of induction, method of monitoring progress, type of pain relief, breech position, type of delivery or vaginal tear. They concluded that aspects of labour and childbirth such as the nature of interventions performed during labour or the nature of delivery appear to be unimportant. Lyons (1998) also found that method of delivery or reported pain severity during labour and delivery was not significantly related to PTSD symptoms. However, mothers were

statistically more likely to have higher scores on the Impact of Events Scale if they were given an epidural or had their labour induced.

Cohen et al (2004) carried out a study to determine whether a difficult birth was associated with symptoms of PTSD. They included a number of variables to examine pregnancy, labour and delivery. They included having an unplanned pregnancy, having any perineal trauma, having an episiotomy, having a long labour (12 hours or more), having labour induced, having an assisted birth or a caesarean section, experiencing a severe level of pain during labour and delivery, and having two or more complications of labour e.g. heavy bleeding or a retained placenta. They found that the only obstetric factor suggestive of a difficult birth that was significantly associated with high post-traumatic symptoms was having two or more maternal complications after labour and delivery.

1.10.3: Personality and Vulnerability Variables

A number of personality and vulnerability factors have been identified as being potential predictors for the development of PTSD following childbirth. Soet et al (2003) found that higher trait anxiety (as measured by the trait anxiety section of the State-Trait Anxiety Inventory) predicted the development of psychological trauma postpartum. Czarnocka and Slade (2002) also found that trait anxiety strongly differentiated between the fully, partially and non-symptomatic PTSD groups in their study, as well as being the primary predictor for total PTSD-Q scores. They also found that those with symptoms of PTSD following childbirth were more likely to have experienced previous mental health problems than the non-symptomatic group. Wijma

et al (1997) also found that PTSD symptoms were related to having received psychiatric/psychological counselling.

Cohen et al (2004) assessed depression prior to pregnancy, depression during pregnancy and panic attacks during pregnancy in an attempt to determine if they predicted post-traumatic symptoms postpartum. They found that all three variables were significantly associated with higher post-traumatic symptoms. Logistic regression revealed that the strongest predictor for high post-traumatic symptoms was prior depressed mood. Women who were depressed during their pregnancy had almost 19 times the odds of high post-traumatic symptoms as women who were not depressed.

Lyons (1998) cited 'Neuroticism' as measured by the Eysenck Personality Inventory to be a significant risk factor and a better predictor for the development of PTSD, than the degree of exposure to trauma. She used this measure and correlated it with the PTSD scores (as measured by the Impact of Events Scale) of 42 first-time mothers. There was a significant association between neuroticism and scores on the Impact of Events Scale (IES) one month after delivery. Mothers' depression scores (as measured by the Edinburgh Postnatal Depression Scale) also correlated with IES scores and scores on the neuroticism scale.

Lyons found that symptoms of post-traumatic stress and postnatal depression coexisted but presented independently, in that some women had high post-traumatic stress scores but low depression scores and some had high depression scores but low post-traumatic stress scores. She also found that there were differences in the mediating variables for the two conditions. Mother's feelings of being in control during labour and delivery

were significantly related to lower scores on the Impact of Events Scale (IES), but not lower scores on the Edinburgh Postnatal Depression Scale (EPDS). In a selection of pain descriptors denoting negative emotions, there was a significant relationship with IES scores, but not with the EPDS scores. Women who had higher scores for perceived social support had significantly lower scores on the IES but not on the EPDS. Finally, women in higher socio-economic groups had significantly lower scores the IES, but not on the EPDS. These findings are interesting because it is often difficult to differentiate between depression scores and PTSD scores due to the high degree of symptom overlap. Lyons cites research findings that suggest that people who have PTSD may also be depressed, but tend to have fewer irrational beliefs or cognitive errors compared to people who are depressed but not affected by PTSD.

Keogh et al (2002) investigated whether prenatal levels of anxiety sensitivity would predict post-traumatic stress disorder symptoms following childbirth. They argued that anxiety sensitivity (AS) is associated with the fear of anxiety-related sensations, and it appears to play a role in a wide range of psychopathological conditions such as panic disorder, depression and post-traumatic stress disorder. They also state that AS has recently been related to a wider range of medical conditions, including the experience and perception of pain. They argue that although childbirth places many women under extreme physical and psychological stress, the experience is highly varied and lies on a continuum, with some women reporting mild stress and others reporting an extreme response. Therefore, it is possible that anxiety sensitivity plays a role in maternal fear and negative appraisal of childbirth. They hypothesised that higher prenatal levels of AS would be positively associated with more PTSD symptoms following childbirth. Forty women participated in the study. Anxiety sensitivity was measured using the

Anxiety Sensitivity Index (ASI). The scale is comprised of three subscales relating to physical, social and mental concerns. Postpartum PTSD was measured using the self-report version of the PTSD Symptom Scale (PSS-SR) and the Impact of Events Scale. They found that prenatal anxiety sensitivity was associated with PTSD scores following childbirth. Therefore prenatal AS may be a promising predictor of postnatal PTSD. However, the PTSD symptoms in this study were collected two weeks after birth. The DSM-IV stipulates that a diagnosis of PTSD cannot be made until symptoms have been present for at least a month. The authors acknowledge therefore, that they may have been measuring acute stress reactions as opposed to PTSD. They also point out that although the Acute Stress Index is the most commonly used measure of anxiety sensitivity, there have been problems associated with the reliability of some of the subscales. They concluded that a combination of pre-natal and postnatal psychological factors were associated with the development of postpartum PTSD, as well as obstetric events.

Soderquist et al (2004) conducted an interesting study aimed at exploring whether traumatic stress could occur before an event that was perceived as threatening or feared. They studied traumatic stress as related to the forthcoming delivery in 1224 pregnant women. They hypothesised that traumatic stress symptoms and fear of childbirth, as measured in late pregnancy, would be positively related, and that pre-trauma characteristics such as high trait anxiety, depressive symptomatology, low stress coping ability, low perceived social support, previous experience of traumatic events and a history of psychological/psychiatric counselling related to childbirth (as measured in early pregnancy), would be related to the occurrence of traumatic stress symptoms and severe fear of childbirth in late pregnancy. They found that 2.3% of

subjects met DSM-IV criteria for PTSD, and symptom criteria B, C and D (i.e. intrusion, avoidance and numbing and increased arousal) were met by 5.8% of women. Traumatic stress and fear of childbirth correlated highly and the authors found that the pre-trauma characteristics (high trait anxiety, depressive symptomatology, low stress coping ability, low perceived social support, previous experience of traumatic events, a history of psychological/psychiatric counselling related to childbirth) were predictors of fear of childbirth and of 'pre' traumatic stress.

1.10.4: Locus of Control / Feeling in Control during Labour & Delivery

Literature from nursing and midwifery reveals that the perception of maintaining control is closely associated with satisfaction during childbirth (Littlefield and Adams, 1987). Wulmuth et al (1978) tested the hypothesis that there is a positive association between a sense of personal control (internal locus of control) and satisfaction with the experience of prepared childbirth. They argued that preparation for childbirth can be seen as an attempt to influence the outcome of a 'medical' procedure by enhancing the patient's sense of control. They studied 450 women delivering at the Medical Centre Hospital of Vermont over a 14-month period. Some of the women had attended preparation for childbirth classes which included instruction in breathing-relaxation techniques as ways to reduce pain. Locus of control was measured using the Rotter Scale and the Postpartum Questionnaire measured aspects relating to mothers' experiences of birth. Wulmuth et al found that the women who attended the preparation for childbirth classes had higher internal loci of control and reported a more satisfactory childbirth.

Soet et al (2003) found that lower ratings of self-efficacy for coping during birth, more feelings of powerlessness and receiving inadequate information were related to women experiencing their birth as traumatic. They used the Pregnancy Attitude Index (PAI) to assess women's locus of control as it related to pregnancy. The scale classifies women according to whether their perceptions of control are determined by their own behaviour (internal), the physician or hospital (external) or by luck or fate (chance). In their study Soet et al used only the internal and external scales to assess locus of control. They found that women who had stronger internal locus of control were more likely to develop post-traumatic stress disorder symptoms after birth. Having a strong internal locus of control is generally accepted to facilitate coping during labour. However, it may be that women who have high internal loci of control are more likely to become stressed when labour does not progress as they had anticipated, and their beliefs about being in control are destroyed. This is the view held by some of the obstetric staff at the hospital where the present study was carried out (personal communication).

Quine et al (1993) examined a number of social and psychological predictors in an attempt to determine women's satisfaction with the quality of their birth experience. Locus of control was measured using the Multidimensional Health Locus of Control. They found that women from lower socio-economic groups were more likely to attribute both health and illness to chance than women from higher socio-economic groups and the women from lower socio-economic groups were less satisfied with their birth experience.

Czarnocka and Slade (2002) found that women with PTSD symptoms felt significantly less in control during labour and delivery compared to the non-symptomatic group. The authors suggested that feeling more in control may diminish fears of threat to self and baby and improve tolerance for pain.

Keogh et al (2002) found that women's perception of control over administration of analgesia during childbirth was significantly associated with postnatal PTSD symptoms, even though actual pain responses were not. They argue that if women are given greater control over pain relief they may be less likely to develop PTSD following labour and delivery.

1.10.5: Expectations of Labour and Delivery

Soet at al (2003) argue that women's expectations about the birth appear to be an important predictor of traumatic experience. In their study, expectations were conceptualised as (1) pre-birth expectations about pain and (2) differences between expectations and actual event. They found that women who expected more pain were more likely to perceive the birth as traumatic. When they examined differences between expectations and experience they found that women whose experience was more negative than expected were more likely to experience the birth as traumatic.

1.10.6: Parity

Wijma et al (1997) found that there were more primiparous women in their PTSD group compared to multiparous women. However, there was no significant difference

in PTSD symptoms between the two groups. Czarnocka and Slade (2000) found primiparous women described themselves as significantly less prepared for their labour and delivery compared to multiparous women, and found the procedures during labour and delivery more unexpected. Primiparous women were also significantly more fearful for their baby and perceived their experience as worse than expected. However, the two groups did not differ significantly in levels of post-traumatic stress after labour and delivery. The authors caution that the lower proportion of multiparous women completing follow-up questionnaires should be taken into consideration when interpreting this finding.

1.10.7: Life Events

There is some evidence that a previous traumatic event may predispose women to a traumatic birth experience since there is a tendency for people with PTSD to relive the traumatic event if anything reminds them of it (Reynolds, 1997). It is possible that that the procedures and pain of childbirth may re-awaken or exacerbate pre-existing traumatic memories. When conducting research examining post-traumatic symptoms following childbirth researchers must try to ascertain whether the symptoms measured are a continuation of a disorder that existed as a result of a trauma prior to childbirth, whether symptoms emerged as a result of events which took place during the birth, events which took place immediately after birth, or a combination of all of the above. Matthey et al (1999) conducted a pilot study examining 31 Cambodian women's pre-migration experiences, their experiences during childbirth in Australia and their psychological morbidity following birth and social support. They found that 48% of the sample scored above cut-off scores for anxiety and depression and 16% of women

had PTSD symptoms related to prior trauma. Statistically significant relationships were found between the number of pre-migration trauma categories experienced or witnessed and measures of PTSD and anxiety and depression. Reports of adverse recent childbirth experiences were related to scores on the Edinburgh Postnatal Depression scale, but not to PTSD scores. However, the correlation between adverse childbirth experiences and PTSD did approach significance ($p = 0.08$) and so a significant association my have been detected in a larger sample. The results of this study should be interpreted with caution due to the sample size and the fact that subjects were self-selecting. Surprisingly no buffer effect for social support was found. The authors postulate that the crude index of social support used may have been inadequate, or that the level of stress experienced by the women may have been too high for available social supports to ameliorate the effects.

Cohen et al (2004) cite that prior trauma is a significant factor in predicting PTSD. However, prior to their study, none of the previous studies examining postpartum PTSD have investigated prior traumatic life events as a predictor for the development of post-traumatic symptoms following childbirth. To assess traumatic life events in 200 Canadian new mothers, Cohen et al used a subset of 12 questions used in the National Comorbidity Survey. Five questions about sexual abuse were excluded. The remaining seven questions asked about direct experience in a war; life-threatening accident; involvement in a fire, flood or natural disaster; witnessing someone badly injured or killed; being threatened by a weapon, held captive, or kidnapped; suffering a great shock because one of the events happened to someone close to them; or having any experience that most other people never go through. Cohen et al grouped responses into two categories, two or more events, or one or no events. They found that having

two or more traumatic life events was significantly related to having higher post-traumatic symptoms following birth. A logistic regression analysis also found that experiencing two or more life events was a significant predictor of high PTS.

Loveland Cook et al (2004) examined rates of PTSD in 744 economically disadvantaged pregnant women. They found that 7.7% of the women met the criteria of PTSD. Women with PTSD were significantly more likely to have had one or more serious medical illnesses in their lifetime and to have met the diagnostic criteria for a major depressive episode, generalised anxiety disorder, and drug dependence or abuse. They had also experienced significantly higher levels of life event stress and physical abuse in the previous 12 to 15 months, and were significantly more likely to report separation from their mother as a child for more than 6 months and to have experienced multiple traumas in their lives, than the women without PTSD.

Geller (2004) draws attention to pregnancy itself as being a stressful life event. For example, the pregnancy may not have been planned and this may cause distress. In the US forty-eight percent of women between the ages of 15 and 44-years of age have experienced at least one unplanned pregnancy at sometime in their lives. Even when the pregnancy has been planned and the baby is wanted, there are a number of variables that could cause potential stress. For some women the presence of a pre-existing medical or psychiatric condition such as epilepsy or bipolar disorder may complicate pregnancy, either through symptoms of the disease itself, or as a result of its treatment, for example the need to use toxic medication during pregnancy. Even if the woman is healthy before becoming pregnant there are a number of medical issues or complications that specifically present themselves either during pregnancy or

shortly afterwards. Screening procedures for prenatal detection of genetic abnormalities can be stressful and contribute to anxiety and distress in pregnant women. While many pregnancy-related medical complications are common, they can be risk factors for more severe health problems and so could contribute to a stressful pregnancy. Chronic hypertension diagnosed before 20 weeks gestation is a complication in 1% to 5% of all pregnancies. Other complications include pre-eclampsia and gestational diabetes mellitus. Both conditions may be harmful to the woman and/or the infant. Tokophobia, i.e. the morbid fear of childbirth, can also cause considerable distress. Anticipatory anxiety in the form of 'pre'- traumatic stress disorder can also be observed in both primiparous and multiparous women who perceive their forth coming delivery as a threatening event.

In addition to, or concurrent, with the pregnancy-related events described above, pregnancy can occur in the context of other major life events. These events can be chronic and enduring stressors, such as the experience of poverty or ongoing domestic violence, or more acute stressful life events, such as the death of a loved one, or a life change such as moving house or getting divorced (Geller, 2004). Peterson (1994) draws attention to the stress and anxiety of pregnancy and childbirth subsequent to perinatal loss. These women may be prone to considerable worry concerning the safe arrival of their new baby, or perhaps overcome with feelings of guilt and disloyalty if they were to love their new baby.

The assessment of previous stressful life events during pregnancy is important. It may be that the woman is already suffering from PTSD or another mental health problem as a consequence of prior trauma or loss, or be extremely stressed as a result of her

current pregnancy. Life stressors not directly related to pregnancy can compound the demands normally imposed by pregnancy and childbirth. Furthermore, stressful life situations can contribute not only to the woman's experience of her pregnancy, but also to the outcome of the pregnancy itself. For example, anxiety in the mother has been associated with various pregnancy complications and outcomes, such as low birth weight, premature delivery, asphyxia, pre-eclampsia, emergency caesarean section, postpartum depression and problems with infant-mother attachment (Geler, 2004). Allen (1998) argues that professionals, such as midwives, doctors and health visitors, should receive training highlighting the issue of women with previous traumatic experiences being more susceptible to trauma in subsequent labours. Detection of such women would enable professionals to be more attentive in allaying fears during labour and hopefully increasing the women's sense of control.

1.10.8: Fear for the Baby

One of the criterion for the diagnosis of PTSD is witnessing an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. It is obvious that giving birth to a premature or sick infant might well fulfil this criterion. Robinson (2002), upon reviewing the literature on causes and effects of postpartum PTSD based on mothers' reports to the Association for Improvements to in the Maternity Services, realised that in some cases separation from the infant after birth might contribute to the aetiology. Separation from the infant is particularly common when the infant is born pre-term, or at high risk, and so the mothers of these infants may be particularly susceptible to the development of PTSD.

In addition to the stress of separation, these mothers are probably particularly fearful for the lives of their newborn infants.

In accordance with the above, Creedy et al (2000) found that the identification of a medical complication for the baby was a particularly distressing event for mothers and contributed to the development of trauma symptoms. Lyons (1998) interviewed 42 first-time mothers 1 to 4 days after delivery. As part of the interview women were asked 'Did you at any time during your labour believe that your baby might die?' Six women (14%) had feared for their babies lives. However, only two of them had high PTSD scores as measured by the Impact of Events Scale.

A number of studies have considered PTSD in mothers of high risk infants. Holditch-Davis et al (2003) studied 30 mothers of high-risk premature infants. Their aim was to examine mothers' responses to having a premature infant in the Special Care Baby Unit (SCBU) and to determine the degree to which the responses were similar to a post-traumatic stress response. A semi-structured interview of the mothers was conducted at 6 months corrected age and the responses were analysed to identify re-experiencing, avoidance and increased arousal. They found that all mothers interviewed had at least one post-traumatic symptom, 12 had two, and 16 had three symptoms. Twenty-six mothers reported increased arousal, 24 mothers reported re-experiencing symptoms and 24 reported symptoms of avoidance. More post-traumatic symptoms were found in mothers who were depressed during their hospital stay and in those who reported more stress about the SCBU. The authors postulated that there may be a group of mothers for whom psychological distress during hospitalisation is predictive of post-traumatic symptoms.

DeMier et al (1996) investigated the relationship between the stress of a high-risk birth and the development of symptoms of post-traumatic stress disorder in 142 mothers. Of the 142 mothers 78 delivered premature infants (gestational age < 38 weeks), 50 delivered healthy, term infants and 14 delivered a term infant who was subsequently hospitalised in a SCBU. Six measures of perinatal stressors were taken and used to predict the frequency of post-traumatic symptoms. The included: gestational age of the baby; birth weight; length of hospital stay for the baby; a postnatal complications rating for the baby and Apgar scores at 1 and 5 minutes. The authors found that both mothers of premature infants and mothers of term infants subsequently hospitalised in a neonatal intensive care unit reported significantly more symptoms of post-traumatic stress than the mothers of healthy term infants. The severity of complications, gestational age, and length of time spent in the SCBU were significant predictors of PTSD, with complications being the primary predictor.

Callahan and Hynan (2002) used the Perinatal Post-traumatic Stress Disorder Questionnaire to assess PTSD in 175 new mothers. One-hundred-and-eleven mothers had given birth to infants born at less than 38 weeks gestation and ten had given birth to medically fragile, full-term infants (high risk group). Fifty-two mothers had given birth to full-term, healthy babies (low risk group). As expected, the authors found that mothers of high-risk infants reported more symptoms of post-traumatic stress than low-risk mothers. The authors concluded that their study provided further evidence that the birth of a high-risk infant should be considered a stressor with the potential of being considered traumatic.

1.11. Aims of the Present Study

The main aim of this study is to contribute to the growing body of knowledge which suggests that women can develop symptoms of post-traumatic stress disorder following childbirth. The study aims to bring together some of the different factors that have emerged as relevant in the field of childbirth and PTSD and assess them in a way suitable for use in general hospitals by frontline mother and child services. It will also consider the mental health needs of perinatal women in NHS Scotland, as promoted by recent Scottish Executive legislation e.g. the Mental Health (Scotland) Act (2003) and the draft framework for child and adolescent mental health services (2004).

The following potential predictive variables will be considered in relation to the development of post-traumatic stress symptoms: number of obstetric interventions; locus of control; number of perinatal life events experienced by new mothers; baby's admission to the Special Care Baby Unit (SCBU); and co-morbid anxiety and depression in the postpartum period.

1.11.1. Number of Obstetric Interventions

A review of the literature concerning the role of obstetric interventions in the development of post-traumatic stress symptoms following childbirth has revealed mixed results. One of the aims of the present study was to examine whether a relationship exists between the number of obstetric interventions women experienced during labour and delivery and the frequency of post-traumatic stress symptoms experienced postpartum.

1.11.2. Locus of Control

Joseph et al (1997) state that it is generally accepted that perceptions of control are adaptive in stressful situations. This suggests that women who believe that they have the ability to exert control over their own health will adapt better to labour and delivery compared to women who believe that they have no control over their own health. Although many studies demonstrate that feeling in control resulted in more satisfactory labour and delivery (Wulmuth, 1978, Quine et al, 1993), one study found that women with high internal loci of control were more likely to develop symptoms of post-traumatic stress disorder following childbirth (Soet et al, 2003). Therefore, this study aimed to examine the relationship between health locus of control and women's experiences of post-traumatic stress symptoms following childbirth.

1.11.3. Number of Life Events Experienced by New Mothers

Ayers and Pickering (2001) point out that many studies examining the relationship between childbirth and PTSD do not control for symptoms during pregnancy, and so it is unclear whether the PTSD being measured is a continuation of a disorder which existed prior to childbirth. In the present study the relationship between life events and post-traumatic symptoms was examined by considering how life events before delivery, during delivery and after delivery impacted upon the frequency of post-traumatic stress symptoms experienced by women.

1.11.4. Baby's admission to the Special Care Baby Unit

If women do develop post-traumatic stress symptoms following childbirth, it could be as a result of events which take place immediately after birth, for example, an infant requiring admission to the Special Care Baby Unit (SCBU).The present study aimed to compare symptoms of post-traumatic stress disorder in women whose infants' were admitted to SCBU compared to those whose were not.

1.11.5. Co-morbid Depression and Anxiety.

Post-traumatic stress disorder often co-exists with other mental health disorders, commonly anxiety and depression. The present study aimed to establish whether women with symptoms of post-traumatic stress disorder following childbirth also experienced co-morbid anxiety and depression.

1.12. Hypotheses

1)   Women can develop symptoms of post-traumatic stress disorder following childbirth.

2)   Women who experience more obstetric interventions will experience more symptoms of post-traumatic stress disorder compared to those who experience fewer obstetric interventions.

3) Women who have a low internal health locus of control will experience more symptoms of post-traumatic stress disorder compared to women who have a high internal locus of control.

4) Women who experience more stressful life events will have more symptoms of post-traumatic stress disorder compared to women who have experienced fewer stressful life events.

5) Women whose baby's are admitted to the Special Care Baby unit will have more symptoms of post-traumatic stress disorder compared to those whose are not.

6) Women who have more symptoms of post-traumatic stress disorder will also have more symptoms of anxiety and depression compared to those with fewer post-traumatic stress symptoms.

CHAPTER TWO

METHOD

2.1 Design

This was a longitudinal, within subjects, correlational design, the purpose of which was to establish whether women could develop post-traumatic symptoms following childbirth, and if so, to attempt to determine what factors contributed to the likelihood of the development of such symptoms.

Questionnaires were administered to assess maternal post-traumatic stress symptom severity, anxiety and depression, health locus of control and stressful life events, one month and three months after giving birth. Demographic information was also gathered.

Independent variables included number of obstetric interventions, health locus of control, number of life events, admission to the Special Care Baby Unit, and anxiety and depression. The dependant variable was post-traumatic symptom severity.

2.2 Participants

The participants were recruited from the largest general hospital in Highland, Raigmore Hospital, NHS Highland, Inverness. All women who gave birth in Raigmore

Hospital in January 2005 were invited to take part in the study. Participants had to be able to give written consent of their agreement to take part in the study, and consent was required from a parent or guardian if participants were under 18 – years old.

Sixty-one women took part in the initial stage of the study. Their ages ranged from 18 – 44 years, with a mean age of 31.6 years. Gestation periods ranged from 32 – 44 weeks.

Fifty-two women took part in the final stage of the study. Twenty-four women were primiparous and 28 were mulitparous.

2.3 Materials

The Impact of Events Scale – Revised, the Hospital Anxiety and Depression Scale, the Multidimensional Health Locus of Control Scale, and general information questionnaires were sent to mothers at both stages of the research process. The Life Events Inventory for New Mothers was sent at stage one only. The questionnaires are described below.

2.3.1 The Impact of Events Scale – Revised (IES-R) (Appendix 2)

The IES-R is a revised version of the Impact of Events Scale, which was designed by Horowitz et al (1979) and is the most widely used self-report measure of specific responses to trauma. The original scale consisted of 15 questions and had two subscales, which measured intrusion and avoidance. The IES-R contains the original

item pool and as such can be used to yield scores comparable to previous research using the IES. However, the IES-R, designed by Weiss and Marmar in 1997 is based on DSM-IV criteria and provides a separate score for hyperarousal in addition to scores for intrusion and avoidance. There are 22 items in all and the questions are scored as follows: 0 = Not at all; 1 = A little bit; 3 = Moderately; 4 = quite a bit and 5 = Extremely. Scores for each subscale can be calculated as well as a total score. One of the main advantages of the IES-R is that it can be administered to a variety of traumatised populations (Turner & Lee, 1998), including obstetric and gynaecological samples (Ayers, 2001).The scale takes about ten minutes to complete and has a time frame of seven days; therefore, it is designed to assess current symptoms regardless of when the traumatic event took place. Although the IES-R subscales parallel the DSM-IV criteria for PTSD, it cannot be used to diagnose PTSD; rather, it should be used as a measure of symptom severity. There are no norms available for the IES-R as yet. However, previous studies using the IES have taken total scores greater than 25 to indicate PTSD caseness (Olff et al 2005; Chemtob et al 1997).

2.3.2 The Hospital Anxiety and Depression Scale (HADS) (Appendix 3)

The Hospital Anxiety and Depression Scale is a 14 item self-assessment tool which takes approximately ten minutes to complete. It was developed by Zigmond and Snaith (1983) and is designed to detect states of anxiety and depression in non-psychiatric medical populations. Seven items measure anxiety and the remaining seven measure depression. Scores for each sub-scale range from 0 to 21. Scores between 0 and 7 are considered to be within the normal range, scores from 8 to 10 are considered borderline and scores in excess of 11 indicate a significant case of psychological morbidity.

2.3.3. The Multidimensional Health Locus of Control Scale: (MHLC). Form A.

(Appendix 4)

The Multidimensional Health Locus of Control (MHLC) was designed by Wallston, Stein and Smith in1994 (Wallston, 1993). It is a general purpose health locus of control scale adaptable for use with any medical or health-related condition. It is a self-report instrument where subjects are asked to respond to each of the 18 statements with ratings ranging from 'strongly disagree' to strongly agree. The questionnaire comes in three formats, form A, B OR C. Forms A and B are designed to be 'equivalent' forms, but the authors tend to use form A when studying relatively healthy samples and form B when studying people with chronic illnesses. Forms A and B measure subjects' general health locus of control beliefs, whereas form C can be adapted to use with respect to a specific condition. Form A was used in the present study as pregnancy is a normal health state rather than a chronic health state. The 18 items on form A form three orthogonal subscales, which are described in more detail below:

Internal locus of control scale:

This subscale assesses the extent to which individuals believe that their health status is controlled by what they themselves do. People who score highly on this subscale believe that they have an influence over their health status and are said to have a high internal health locus of control.

Chance health locus of control:

Individuals who rate highly on this subscale tend to believe that their health status is largely down to chance, luck or fate. They are described as having a high external health locus of control.

Powerful others health locus of control:

Individuals who rate highly on this subscale tend to believe that their health status is controlled by other individuals, such as members of the medical profession, family or friends. People who score highly on this subscale are also described as having a high external health locus of control.

2.3.4 The Life Events Inventory for New Mothers (Appendix 5)

This inventory was designed by Barnett, Hanna and Parker (1983) to address the lack of life event scales appropriate to obstetric groups, and was standardised on predominantly middle class Australian women. The inventory assesses the occurrence of general life events, (e.g. moving house), as well as life events specific to pregnancy and childbirth, e.g. 'You had blood pressure trouble'; 'The labour / delivery was very painful'.

There were 58 items in the original inventory. However the authors state that it is possible to remove some items depending on what was being studied. In the present study items pertaining to the early stages of pregnancy were removed since the present study is particularly concerned with childbirth. In addition an item regarding the

woman's obstetrician being unable to be present at the delivery was omitted, as it is not standard practice for an obstetrician to be present at all births in the UK.

When completing the inventory subjects are asked to circle 'yes' or 'no' following each item, depending on whether they experienced the life event. Subjects specify whether the event took place before or after the birth. If the event occurred before the birth subjects are asked to indicate approximately when the event took place. In addition subjects are asked to mark a visual analogue scale following each item ranging from 0 ('not at all distressing') to 100 ('as distressing as it could possibly be'). However, in a subsequent study (Woodhouse, 1997) found that the analogue scale was no more informative than a simple yes-no dichotomy. Therefore it was decided to omit the analogue scale in the present study for the reason of brevity.

At the end of the form subjects are asked to indicate whether the person closest to them was supportive or not.

2.4.5 General Information Questionnaire (Appendix 6)

This questionnaire was designed specifically for the present study to gather general demographic information, including age, marital status, occupation and parity. Subjects were required to indicate the number of obstetric interventions they experienced during the delivery of their baby and were asked to rate how their overall hospital experience was in comparison to what they had expected.

2.4. Procedure

The first stage of the research process was to consider any ethical issues relating to the research being carried out and to obtain ethical approval. Inclusion criteria included being able to give informed consent. A parent or guardian was required to give consent if the participant was under 16-years-old.

All participants were asked to give their consent for the researcher to contact their general practitioners with a summary of their test results. In this way any vulnerable women, that is, those suspected of suffering from PTSD, or clinical levels of anxiety or depression could be identified and helped.

In order to ensure the confidentiality of the participants completed questionnaires were located in the researcher's lockable filing cabinet, which was located in the researcher's office. Data stored on computer was anonymised so that participants could not be identified. The principle researcher was the only person with access to the data. In order to further secure the data, the computer used to analyse the data was not connected to a modem or network.

It was noted that some of the questions in the questionnaires could upset some participants by stirring up painful memories, e.g. 'Has anyone close to you died?' In response to this participants were given the opportunity to record anything that caused them distress at the bottom of the general information questionnaire. In this way any such individuals could be contacted and offered help if they required it.

The project was approved by the Local Research Ethics Committee and the medical director of NHS Highland in January 2005.

All 155 women who gave birth in January 2005 at the main general hospital in Inverness were invited to take part in the study. Women were contacted by post approximately one month after giving birth. They received an information sheet outlining the purpose of the research (appendix 7) and a consent form (appendix 8), which they signed and returned if they wished to participate. They also received the Impact of Events Scale-Revised, the Hospital Anxiety and Depression Scale, the Multidimensional Health Locus of Control Scale, the Life Events Inventory for New Mothers and the General Information Questionnaire at this point. All women who completed questionnaires in the first instance were contacted again by post three months later. This time they were required to complete the Impact of Events Scale-Revised, the Hospital Anxiety and Depression Scale and the Multidimensional Health Locus of Control Scale. Participants returned their responses in a stamped, addressed envelope, which was provided for them. The cover letter can be found in Appendix 9.

2.5. Analysis

The data were analysed using the Statistical Package for the Social Sciences (SPSS) for Windows (Version 10). In keeping with convention (Clark-Carter, 2004) the threshold for significance used throughout the analysis was $p < 0.05$. All tests used were two-tailed in order to permit the analysis of results which emerged that were not in the predicted direction.

Box plots would be used to identify outliers and to determine the distribution of the data. If the data obtained is normally distributed, then parametric tests would be used. Pearson's Product Moment Correlations would be used to measure the relationship between mothers' PTSD scores and level of obstetric intervention, mothers' PTSD scores and locus of control and mothers' PTSD scores and number of stressful life events. T-tests would be employed in order to measure the difference between the PTSD scores of the mothers whose baby's were admitted to SCBU compared to the PTSD scores of mothers whose baby's were not admitted to SCBU, and between the PTSD scores of those who had previous mental health problems compared to those who did not..

If the data is skewed then non-parametric tests would be employed. Spearman's rho correlations would be used to measure the relationships between mothers' PTSD scores and level of obstetric intervention, mothers' PTSD scores and locus of control and mothers' PTSD scores and number of stressful life events. Mann-Whitney tests would be employed in order to measure the difference between the PTSD scores of the mothers whose baby's were admitted to SCBU compared to the PTSD scores of mothers whose baby's were not admitted to SCBU, and between the PTSD scores of those who had previous mental health problems compared to those who did not.

Since there was only a few incidence of missing data, the listwise deletion method was employed, that is, the data was simply omitted. According to Howell (2005) this is the most common approach to treating missing data. He argues that although listwise deletion can often result in a decrease in the sample size available for analysis, it is advantageous in that it leads to unbiased parameter estimates.

Finally, a power analysis of the main hypotheses was carried out. In order to detect a low to moderate correlation of at least 0.04 with an alpha of 0.05 and a power of 0.08, a sample size of 48 would be required. Levels of correlation lower than 0.04 were not judged to be of clinical or theoretical importance.

CHAPTER THREE

RESULTS

3.1 Sample Characteristics

Of the 155 women who were initially contacted, questionnaires were returned by 61 women at stage one (61/155), and 52 women at stage two (52/61). These figures represent return rates of 39.3% and 85.2% respectively, of the total number of women contacted at each stage.

Subjects ranged in age from 18 to 44 years (M = 31.6 yrs; SD = 6.2). Gestation periods ranged from 32 weeks to 42 weeks (M = 39.1 weeks; SD = 1.8). Twenty- four women were primiparous (46.2%) and 28 were multiparous (53.8%). Details regarding parity were not available for nine women. Twenty of the multiparous women had one older child, five had two older children, two had three older children and one had four older children. Thirty-nine women were married, 21 were in a relationship with their baby's father and one was not currently in a relationship. Forty women lived in their own home, six lived in rented accommodation, eight lived in council accommodation and seven lived in 'other' accommodation (three lived in Housing Association accommodation, two lived with their parents, one lived with her in-laws and one lived in a tied house). Twenty-five women were skilled workers (41%), thirty-four were unskilled workers (56%) and details were unavailable for 2 women (3%). Fifteen women had suffered from previous mental health problems (24.6%) and 37 (60.7) had not. Details regarding previous mental health problems were not available for nine women. Table 1 below summarises the sample characteristics.

Table 1: Demographic Characteristics of Participants

Characteristic	Mean	Range	SD
Age	31.6	18 – 44	6.2
Gestation	39.1	32 – 42	1.8

	N	%
Primiparous	24	39.3
Multiparous	28	45.9
Two Children	20	32.8
Three Children	5	8.2
Four Children	2	3.3
Five Children	1	1.6
Missing	9	14.8
Married	39	63.9
In Relationship With Baby's Father	21	34.5
Not Currently in a Relationship	1	1.6
Own Home	40	65.6
Rented Accommodation	6	9.8
Council Accommodation	8	13.1
Other	7	11.5
Skilled Workers	25	41
Unskilled Workers	34	56
Previous Mental Health Problems	15	24.6
No Previous Mental Health Problems	37	60.7

3.2 Non-Responders

An independent samples t-test was performed to discover if there was a significant differences in age between responders and responders. It was found that the non-responders were significantly younger (N = 94; M = 29.2, SD = 5.8) than the responders (N = 52, M = 32.0, SD = 6.6), (t = 2.59; df = 144; $p < 0.05$)

A second independent samples t-test was performed to ascertain if there was a significant difference in age between those who responded at Time One and Time Two (N = 52; M = 32.0, SD = 5.8) and those who only responded at Time One (N = 9; M = 29.8, SD = 8.7). No significant difference in age was found between the two groups (t = .744; df = 9.3; $p > 0.05$).

3.3 Birth Experiences

The number of days mothers spent in hospital after giving birth ranged from one to 24 (M = 5.06 days; SD = 4.52). Of all babies born eight (13.1%) were admitted to SCBU and 53 (86.9%) were not. Time spent in SCBU ranged from one day to 28 days (M = 10.12 days; SD = 11.16).

Seven women rated their overall experience in hospital as being much better than expected (11.9%), 14 said it was better than expected (23.7%), 30 said it was as they expected (50.8%), three said it was worse than they expected (5.1%), and five said it was much worse than expected (8.5%). This information is summarised in Table 2.

Table 2: Frequency & Percentage of Woman's Ratings of Hospital Experience

	N	%
Much better than expected	7	11.9
Better than expected	14	23.7
As expected	30	50.8
Worse than expected	3	5.1
Much worse than expected	5	8.5

Ten women had a natural birth (16.4%); 31 had a vaginal delivery and used pain relief (51%); 10 had their labour induced (16.4%); 21 had an episiotomy (34.4%); 12 had an instrumental delivery (19.7%); seven had an elective caesarean (11.5%); 13 had an emergency caesarean (21.3%); 37 rated the delivery as being very painful (60.7); 25 stated that medical complications arose during the delivery (41%); one woman had an anaesthetic and was not awake when her baby was born (1.6%); seven stated that their partner was not present at the delivery (11.5%); 25 said their baby arrived before the expected date (41%) and 31 said their baby arrived after the expected date (50.8%). This information is summarised in Table 3 below.

Table 3: Frequency & Percentage of Birth Experiences

	N	%
Natural Birth	10	16.5
Vaginal Delivery with Pain Relief	31	51
Used Pain Relief	51	83.6
Induced Delivery	10	16.4
Episiotomy	21	34.4
Instrumental Delivery	12	19.7
Elective Caesarean	7	11.5
Emergency Caesarean	13	21.3
Delivery Very Painful	37	60.7
Medical Complications	25	41
Not Awake When Baby Born	1	1.6
Partner Not Present	7	11.5
Baby Arrived Before Expected	25	41
Baby Arrived After Expected	31	50.8

3.4 Life Events

The total number of life events comprised of the number of life events pre-delivery, the number of labour and delivery events and the number of life events post-delivery. The mean total number of life events experienced by women was 5.9 (SD = 2.9), ranging from 2 to 16. The mean number of pre-delivery life events was 1.4 (SD = 1.8), ranging from 0 to 10. The mean number of labour and delivery events was 3.1 (SD = 1.2),

ranging from 1 to 7, and the mean number of life events post-delivery was 1.3 (SD = 1.2), ranging from 0 to 5. The data on life events are summarised in Table 4.

Table 4: Summary of the Number of Life Events Experienced by Participants

	Life Events Pre-Delivery	Labour and Delivery Events	Life Events Post-Delivery	Total Number of Life Events
Mean	1.4	3.1	1.3	5.9
SD	1.8	1.2	1.2	2.9
Minimum	0	1	0	2
Maximum	10	7	5	16

3.5. Prevalence of Post-Traumatic Stress Disorder Following Childbirth

Women completed the Impact of Events Scale – Revised (IES-R) one month after giving birth (N = 61). Total scores of 25 or more are considered to indicate a clinical level of distress. IES-R scores < 25 were categorised as low and scores >25 were categorised as high. Since the IES-R data were highly skewed the mean is not an appropriate summary statistic. Therefore the median and range will be reported instead of the mean and the standard deviation. The median score on the IES-R at Time one was 5 and scores ranged from 0 to 77. Fifty-two women scored within the low category (85.2%), and 9 women scored within the high category (14.8%).

In order to establish whether high scores represented a transient reaction to a stressful life event, women completed the IES-R again three months after giving birth (N = 52). Once again scores were divided into low and high. The median score was 2.5. Scores ranged from 0 to 62. Forty-seven women scored within the low category (90.4%) and 5 women scored within the high category (9.6%). This information is summarised in Table 5 below.

Table 5: Frequency and Percentage of High and Low IES-R Scores Following Childbirth

	N	F	%
IES-R Time I	61		
Low		52	85.2
High		9	14.8
IES-R Time II	52		
Low		47	90.4
High		5	9.6

The data were examined on an individual level in order to ascertain whether the decrease in PTSD symptomatology observed from Time One to Time Two was as a result of a genuine decrease of reported symptoms, or whether women with PTSD symptomatology at Time One did not respond at Time Two. Four of the women (6.6%) who had high scores at Time One also had high scores at Time Two. Five women (8.2%) who had high scores at Time One had low scores at Time Two, and one woman (1.6%) who did not have high scores at Time One had high scores at Time Two. Table 6 below summarises these findings.

Table 6: Frequency and Percentage of Women Suffering from PTSD Symptoms One Month (T1) and Three Months (T2) After Giving Birth

	T1 & T2	T1 Only	T2 Only
Frequency	4	5	1
%	6.6	8.2	1.6

3.6. Number of Obstetric Interventions

Mann-Whitney tests were used to ascertain whether significant differences in PTSD occurred depending on a number of obstetric interventions at Time One. There were no significant differences in PTSD scores between those who had a natural delivery (median = 7, range = 0 – 77) and those who did not (median = 6, range = 0 – 54), ($U = 241.500$, $N1 = 10$, $N2 = 51$, $p = .790$); between those who had an induced labour (median = 7, range = 0 – 42) and those who did not (median = 4, range = 0 – 77), ($U = 161.500$, $N1 = 10$, $N2 = 51$, $p = .065$); between those who had an episiotomy (median = 6, range = 0 – 54) and those who did not (median = 4, range 0 – 77), ($U = 332.000$, $N1 = 21$, $N2 = 40$, $p = .176$); between those who had an instrumental delivery (median = 6, range = 0 – 17) and those who did not (median = 4, range = 0 = 77), ($U = 256.500$, $N1 = 12$, $N2 = 49$, $p = .491$); between those who had an elective caesarean section (median = 3, range = 0 – 9) and those who did not (median = 5, range = 0 – 77), ($U = 162.000$, $N1 = 7$, $N2 = 54$, $p = .557$); or between those who had an emergency caesarean section (median = 5, range 0 – 42) and those who did not (median = 2, range = 0 – 77), ($U = 250.000$, $N1 = 13$, $N2 = 48$, $p = .269$). All differences remained non-significant at Time Two. This information is summarised in Table 7 below.

Table 7: Mann Whitney Results for Each Obstetric Intervention

Event	Medians	Ranges	Mann-Whitney
Natural birth	7	0 – 77	
			$U = 254.500$, $N1 = 10$, $N2 = 51$, $p = .790$
Not natural birth	6	0 - 54	
Induced labour	7	0 – 42	
			$U = 161.500$, $N1 = 10$, $N2 = 51$, $p = .065$
Labour not induced	4	0 - 77	
Episiotomy	6	0 – 54	
			$U = 332.000$, $N1 = 21$, $N2 = 40$, $p = .176$
No episiotomy	4	0 - 77	
Instrumental delivery	6	0 -17	
			$U = 256.500$, $N1 = 12$, $N2 = 49$, $p = .491$
No instrumental delivery	4	0 - 77	
Elective caesarean	3	0 – 9	
			$U = 162.000$, $N1 = 7$, $N2 = 54$, $p = .557$
No elective caesarean	5	0 - 77	
Emergency caesarean	5	0 – 42	
			$U = 250.000$, $N1 = 13$, $N2 = 48$, $p = .269$
No emergency caesarean	2	0 - 77	

The total number of obstetric interventions each woman received was calculated and correlated with their scores on the IES-R at Time One and Time Two. Spearman's rho correlations revealed that there was not a significant association between number of obstetric interventions and post-traumatic symptoms at time one ($rho = .225$, $n = 61$, $p = .081$), or time two ($rho = - .042$, $n = 52$, $p = .765$). Table 8 below summarises this information.

Table 8: Correlation Coefficients and Significance Levels for Number of Obstetric Interventions and IES-R Scores.

	IES-R I	IES-R II
Number of obstetric interventions		
Spearman's rho	.225	- .042
Sig. (2-tailed)	.081	.765
N	61	52

3.7. Health Locus of Control

Spearman's rho correlations revealed no significant association between internal locus of control scores and PTSD symptoms (rho = .169, n = 61, p = .194) at Time One or at Time Two (rho = .154, n = 52, p = .276). Neither was there a significant association between chance health locus of control scores and PTSD symptoms (rho = .105, n = 61, p = .420) at Time One or at Time Two (rho = .043, n = 52, p = .764), or between powerful others health locus of control scores and PTSD symptoms (rho = .132, n = 61, p = .312) at Time One or at Time Two (rho = .114, n = 52, p = .420). Table 9 below summarises this information.

Table 9: Correlation Coefficients and Significance Levels for Locus of Control: Internal, Chance and Powerful Others

	Time 1	Time 2
Internal		
Spearman's rho	.169	.154
Sig. (2-tailed)	.194	.276
Chance		
Spearman's rho	.105	.043
Sig. (2-tailed)	.420	.764
Powerful Others		
Spearman's rho	.132	.114
Sig. (2-tailed)	.312	.420
N	61	52

3.8. Stressful Life Events

The Life Events Inventory for New Mothers was used to ascertain the number of life events experienced by participants' pre - delivery, during delivery and post - delivery. Spearman's rho correlations revealed a significant association between total number of life events and PTSD symptoms at Time One (rho = .476, n = 61, p = .000) and at Time Two (rho = .445, n = 52, p = .001). This information is summarised in Table 10 below.

Table 10: Correlation Coefficients and Significance Levels for Total Number of Stressful Life Events and IES-R Scores at Time I & Time II.

Number of Stressful Life Events	IES-R I	IES-R II
Spearman's rho	.476	.445
Sig. (2-tailed)	.000	.001
N	61	52

In order to ascertain whether post, during or pre-birth life events were particularly pertinent correlations were performed on each category individually. Spearman's rho correlations revealed that there was not a significant association between the number of life events occurring pre-delivery and PTSD symptoms at Time One (rho = .240, n = 61, p = .062). There was a significant associations between events which occurred during delivery and PTSD symptoms at Time One (rho = .302, n = 61, p = .018), and between the number of events which occurred post-delivery and PTSD symptoms at Time One (rho = .398, n = 61, p = .001). Table 11 below summarises this information.

Table 11: Correlation Coefficients and Significance Levels for Number of Stressful Life Events Pre, During and Post-Delivery and IES-R Scores for Time I.

IES-R Scores (T1)	Pre-Delivery	During Delivery	Post-Delivery
Spearman's rho	.240	.320	.398
Sig. (2-tailed)	.062	.018	.001
N	61	61	61

Spearman's rho correlations revealed that the association between the number of life events occurring pre-delivery and PTSD symptoms at Time One remained not significant at Time Two (rho = .148, n = 52, p = .259). The significant associations between events which occurred during delivery and PTSD symptoms at Time One was no longer significant at Time Two (rho = .269, n = 52, p = .054). However, the significant association between the number of events which occurred post-delivery and PTSD symptoms at Time One remained significant at Time Two (rho = .487, n = 52, p = .000). This information is summarised in Table 12 below.

Table 12: Correlation Coefficients and Significance Levels for Number of Stressful Life Events Pre, During and Post-Delivery and IES-R Scores for Time 2.

IES-R Scores (T2)	Pre-Delivery	During Delivery	Post-Delivery
Spearman's rho	.148	.269	.487
Sig. (2-tailed)	.295	.054	.000
N	52	52	52

3.9. IES-R Scores and Baby's Admission to SCBU

Eight participants' babies were admitted to SCBU and 53 were not. IES-R scores from mothers whose babies were admitted to SCBU (median = 16.5, range = 3 - 54) and those whose babies were not (median = 3, range = 0 - 77) were compared using the non-parametric Mann-Whitney test, as the IES-R data was significantly skewed. The IES-R scores of the mothers whose babies were admitted to SCBU were significantly

higher than those whose babies were not (U = 96.500, N1 = 8, N2 = 53, p = .012) at Time One.

Further analysis was undertaken to determine the extent to which the intrusion, avoidance and hyperarousal subscales were influenced by SCBU admission at Time One. The Mann-Whitney test was used to compare intrusion scores of mothers whose babies were admitted to SCBU (median = 6, range = 2 - 20) with those whose babies were not (median = 1, range = 0 - 29). The intrusion scores of the mothers whose babies were admitted to SCBU were significantly higher than those whose babies were not. (U = 98.500, N1 = 8, N2 = 53, p = .013). The avoidance scores of the mothers whose babies were admitted to SCBU (median = 4.5, range = 1 - 15) were also higher than those whose babies were not (median = 1, range = 0 - 29), (U = 106.500, N1 = 8, N2 = 53, p = .020). Finally, the hyperarousal scores of mothers whose babies were admitted to SCBU (median = 1.5, range = 0 - 19) were found to be higher than those whose babies were not (median = 0, range = 0 - 19), (U = 121.000, N1 = 8, N2 = 53, p = .023). This information is summarised in Table 13 below.

Table 13: Mann-Whitney Results Examining the Relationship Between Baby's Admission to SCBU and Mothers IES-R Scores at Time One

Total IES-R Scores	Median	Range	Mann-Whitney
In SCBU	16.5	3-54	
			$U = 96.500, N1 = 8, N2 = 53, p = .012$
Not in SCBU:	3	0-77	
Intrusion Scores			
In SCBU	6	2-20	
			$U = 98.500, N1 = 8, N2 = 53, p = .013$
Not in SCBU	1	1-29	
Avoidance Scores			
In SCBU	4.5	1-15	
			$U = 106.500, N1 = 8, N2 = 53, p = .020$
Not in SCBU	1	0-29	
Hyperarousal Scores			
In SCBU	1.5	0-19	
			$U = 121.000, N1 = 8, N2 = 53, p = .023$
Not in SCBU	0	0-19	

The same analyses were carried out to examine the Time Two data. No significant differences were found between those whose babies were admitted to SCBU and those whose babies were not for total IESR-R scores, intrusion scores, avoidance scores or hyperarousal scores.

3.10. Hospital Anxiety and Depression Scale

The data were analysed to determine what proportion of women had clinical levels of anxiety and depression at one month and three months postpartum. It was found that 45 (73.8 %) women scored within the normal range for anxiety one month after giving birth. Nine women (14.8%) were in the borderline range, and seven (11.5%) scored within the moderate to severe range. Fifty women (82%) scored within the normal

range for depression one month after giving birth. Four women (6.6%) scored within the borderline range and seven (11.5%) scored within the moderate to severe range. Three months after giving birth 40 (76.9) women scored within the normal range for anxiety. Five (9.6%) scored within the borderline range and 7 (13.5%) scored within the moderate to severe range. Forty-two women (80.2%) scored within the normal range for depression three months after giving birth. Eight women (15.4%) scored within the borderline range and two (3.8%) scored within the moderate to severe range. This information is summarised in Table 14 below.

Table 14: Hospital Depression & Anxiety Scores for Women One Month & Three Months After Giving Birth.

ANXIETY T1	N	%
Normal	45	73.8
Borderline	9	14.8
Moderate to Severe	7	11.5
DEPRESSION T1		
Normal	50	82
Borderline	4	6.6
Moderate to Severe	7	11.5
ANXIETY T2		
Normal	40	76.9
Borderline	5	9.6
Moderate to Severe	7	13.5
DEPRESSION T2		
Normal	42	80.8
Borderline	8	15.4
Moderate to Severe	2	3.8

The Mann-Whitney test was used to establish whether those who had high scores on the IES-R had significantly higher scores on the HADS, compared to those with low scores on the IES-R. The HADS anxiety scores of the mothers who scored highly on the IES-R (median = 16, range = 2-21) were significantly higher than those who had low scores on the IES-R (median = 4.5, range = 0-12), (U = 77.500, N1 = 9, N2 = 52, p = .001) at Time One. The difference remained significant at Time Two (high anxiety median = 11, range = 6-20; low anxiety median = 4, range = 0-14), (U = 30.000, N1 = 5, N2 = 47, p = .006). The HADS depression scores of the mothers who scored highly on the IES-R (median = 12, range = 2-18) were also significantly higher than those who had low scores on the IES-R at Time One (median = 3, range = 0-12), (U = 70.500, N1 = 9, N2 = 52, p = .001). However the difference was no longer significant at Time Two (U = 81.500, N1 = 5, N2 = 47, p = .273). This information is summarised in Table 15 below.

Table 15: HADS Scores of High & Low Scorers on IES-R

Measure	Median	Range	Mann-Whitney High Vs Low IES-R Scores
HADS Anxiety T1			
High	16	2 – 21	
Low	4.5	0 - 12	U = 77.500, N1 = 9, N2 = 52, p = .001
HADS Anxiety T2			
High	11	6 – 20	
Low	4	0 - 14	U = 30.000, N1 = 5, N2 = 47, p = .006
HADS Depression T1			
High	12	2 – 18	
Low	3	0 - 12	U = 70.500, N1 = 9, N2 = 52, p = .001
HADS Depression T2			
High	8	0 – 16	U = 81.500, N1 = 5, N2 = 47, p = .273
Low	2.5	0 - 9	

Because previous research has demonstrated that those with a history of mental health problems are more prone to developing PTSD, the data were analysed further to ascertain if subjects with a history of mental health problems had higher PTSD, anxiety and / or depression scores.

A Mann-Whitney test revealed that those with previous mental health problems did not have significantly higher IES-R scores (median = 6, range = 0 – 77) compared to those with no previous mental health problems (median = 4, range = 0 -54) one month after delivery (U = 202.000, N1 = 15, N2 = 37, p = .122). No significant difference was found between those with previous mental health problems (median = 4, range = 0 –

62) and those without previous mental health problems (median = 2, range = 0 – 45) three months after delivery (U = 240.000, N1 = 15, N2 = 37, p = .437).

Those with previous mental health problems did have significantly higher anxiety scores (median = 8, range = 0 – 21) compared to those with no previous mental health problems (median = 4, range = 1 – 16) one month after delivery (U = 134.500, N1 = 15, N2 = 37, p = .004). Those with previous mental health problems also had higher depression scores (median = 5, range = 0 – 18) compared to those with no previous mental health problems (median = 3, range = 0 – 11) one month after delivery (U = 174.000, N1 = 15, N2 = 37, p = .035).

Subjects with previous mental health problems had significantly higher anxiety scores (median = 7, range = 0 – 20) than those with no previous mental health problems (median = 4, range = 0 – 12) three months following delivery (U = 146.500, N1 = 15, N2 = 37, p = .008). However, the difference in depression scores between those with previous mental health problems (median = 4, range = 0 – 16) and those without previous mental health problems (median = 2, range = 0 – 8) was no longer significant three months after giving birth (U = 192.500, N1 = 15, N2 = 37, p = .083). This information is summarised in Table 16 below.

Table 16: IES-R and HADS Scores For Those With & Without Previous Mental Health Problems One Month & Three Months Following Delivery

Measure	Median	Range	Mann-Whitney With Vs Without Previous Mental Health Problems
IES-R: Time 1			
With Previous MH Problems	6	0 – 77	U = 202.00, N1 = 15, N2 = 37, p = .122
No Previous MH Problems	4	0 - 54	
IES-R: Time 2			
With Previous MH Problems	4	0 – 62	U = 240.000, N1 = 15, N2 = 37, p = .437
No Previous MH Problems	2	0 - 45	
HADS Anxiety: Time 1			
With Previous MH Problems	8	0 – 21	U = 134.500, N1 = 15, N2 = 37, p = .004
No Previous MH Problems HADS Depression: Time 1	4	0 - 16	
With Previous MH Problems	5	0 – 18	U = 174.000, N1 = 15, N2 = 37, p = .035
No Previous MH Problems HADS Anxiety: Time 2	3	0 – 11	
With Previous MH Problems	7	0 – 20	U = 146.500, N1 = 15, N2 = 37, p = .008
No Previous MH Problems HADS Depression: Time 2	4	0 – 12	
With Previous MH Problems	4	0 – 16	U = 192.500, N1 = 15, N2 = 37, p = .083
No Previous MH Problems	2	0 - 8	

Table 17 below summarises the Mann-Whitney analysis, correlational analyses, correlation coefficients and significance levels for all the hypotheses generated.

Table 17: Summary Table for Mann-Whitney Results, Correlational Analyses and Significance Levels for Main Hypotheses: Time 1 (T1) and Time 2 (T2)

Hypotheses	Variable	Mann-Whitney Analysis & Correlations with IES-R Scores	Significant
2	Number of obstetric interventions	T1: rho = .225, n = 61, p = .081	NS
		T2: rho = - .042, n = 52, p = .765	NS
3a	Internal Health Locus of Control	T1: rho = .169, n = 61, p = .194	NS
		T2: rho = .154, n = 52, p = .276	NS
3b	Chance Health Locus of Control	T1: rho = .105, n = 61, p = .420	NS
		T2: rho = .043, n = 52, p = .764	NS
3c	Powerful Others	T1: rho = .132, n = 61, p = .312	NS
		T2: rho = .114, n = 52, p = .420	NS
4	Number of Stressful Life Events	T1: rho = .476, n = 61, p = .000	<0.01
		T2: rho = .445, n = 52, p = .001	<0.01
5	Babies Admission to SCBU	SCBU IES-R: median = 16.5, range = 3-54 No SCBU IES-R: median = 3, range = 0-77	
		T1: U = 96.500, N1 = 8, N2 = 53, p = .012	<0.05
		T2: U = 95.500, N1 = 7, N2 = 45, p = .097	NS

Table 17: Summary Table for Mann-Whitney Results, Correlational Analyses and Significance Levels for Main Hypotheses: Time 1 (T1) and Time 2 (T2) Continued

		High IES-R: median = 16, range = 2-21 Low IES-R: median = 4.5, range = 0-12	
6a	HADS Anxiety	T1: U = 77.500, N1 = 9, N2 = 52, p = .001	<0.01
		High IES-R: median = 11, range = 6-20 Low ISE-R: median = 4, range = 0-14	0.05
		T2: U = 30.00, N1 = 5, N2 = 47, p = .006	
		High IES-R: median = 12, range = 2-18 Low IES-R: median = 3, range = 0-12	
6a	HADS Depression	T1: U = 70.500, N1 = 9, N2 = 52, p = .001	<0.01
		High IES-R: median = 4, range = 0 - 16 Low ISE-R: median = , range = 0-18	NS
		T2: U = 81.50, N1 = 5, N2 = 47, p = .273	

3.11. Logistic Regression

A logistic regression analyses was completed for Time One and Time Two in an attempt to develop a model for predicting the development of post-traumatic symptoms following childbirth. A logistic regression was employed because the IES-R data had been categorised into high and low scores due to the highly skewed nature of the data. The results of this analysis should be interpreted with caution due to the small number of subjects included in this study. The predictor variables entered into the analysis included the three variables which were found to be significantly related to IES-R scores in sections 3.5, 3.7 and 3.9 above (baby being admitted to SCBU, number of

stressful life events and HADS depression and anxiety). Number of obstetric life events were also entered as this variable approached significance at time 1. However, no significant predictor variables emerged from the analysis at Time One or Time Two. The results of the logistic regression for Time One are summarised in Table 18 below.

Table 18: Results of Logistic Regression to Predict Symptoms of PTSD for Time 1

Variables in Equation	B	S.E.	Wald	df	Sig	Exp(B)
Baby in SCBU	-.028	1.568	.000	1	.986	.972
Life Events	.278	.228	1.491	1	.222	1.320
HADS Anxiety	.265	.229	1.334	1	.248	1.303
HADS Depression	.095	.262	.131	1	.717	1.099
No. of Obstetric Interventions	-.807	.746	1.170	1	.279	.446

Table 19 below summarises the results of the logistic regression for Time Two.

Table 19: Results of Logistic Regression to Predict Symptoms of PTSD for Time 2

Variables in Equation	B	S.E.	Wald	df	Sig	Exp(B)
Baby in SCBU	5.203	3.034	2.940	1	.086	181.745
Life Events	.862	.759	1.288	1	.256	2.367
HADS Anxiety	1.062	.648	2.684	1	.101	2.891
HADS Depression	-.636	.466	1.866	1	.172	.529
No. of Obstetric Interventions	11.472	1.291	1.299	1	.254	.229

3.12. Incidental Findings

Investigations into whether a number of demographic variables affected IES-R scores were carried out. There was no significant difference between the IES-R scores of those who owned their own home and those who did not at Time One or Time Two (U = 371.500, N1 = 39, N2 = 22, p = .380), or between those with skilled jobs and those with unskilled jobs at Time One or Time Two (U = 402.000, N1 = 25, N2 = 54, p = .721); nor was there a significant difference in IES-R scores between those who were married and those who were not at Time One or Time Two (U = 393.500, N1 = 39, N2 = 22, p = .588). It was not possible to make a comparison between those who felt supported by the person closest to them (N = 59) and those who did not (N = 1) due to small numbers.

Spearman's rho correlations revealed no significant relationship between participants age and IES-R scores at time Time One or Time Two (rho = .006, n = 61, p = .995), or gestation period and IES-R scores at Time One or Time Two (rho = .041, n = 58, p = .761). However, there was a significant relationship between the time participants' babies spent in SCBU and IES-R scores at Time One (rho = .314, n = 61, p = .014), and between the time participants' spent in hospital and their IES-R scores at Time One (rho = .308, n = 59, p = .018). The relationship between time spent in hospital and IES-R scores remained significant at Time Two (r = .400, n = 50, p = .004), but time spent in SCBU and IES-R scores did not (rho = .243, n = 52, p = 0.82).

Mann-Whitney tests revealed a significant difference between the IES-R scores of primiparous women (median = 6.5, range = 0-54) and multiparous women (median = 2.5, range = 0-77) at Time One(U = 212.000, N1 = 24, N2 = 28, p = .021) and Time Two (primiparous median = 5.5, range = 0-62; multiparous median = 0, range = 0-58), (U = 176.000, N1 = 24, N2 = 28, p = .004).

No significant difference was found between those with previous mental health problems and those with no previous mental health problems at Time One (U = 213.500, N1 = 15, N2 = 37, p = .189) or at Time Two (U = 240.000, N1 = 15, N2 = 37, p = .437).

Finally, Fisher's exact test was carried out in order to examine the relationship between mothers' hospital experience and high (n = 8) and low (n = 51) IES-R scores. The 'much worse', 'worse' and 'as expected' data were combined (n = 38), and the 'better' and 'much better' data were combined (n = 21) in order to permit a valid comparison.

However, no association was found between hospital experience and IES-R scores (p = 0.70).

Table 20 below summarises the Mann-Whitney analysis, correlational analyses, correlation coefficients and significance levels for all incidental investigations.

Levels Table 20: Summary Table for Mann-Whitney Results, Correlational Analyses and Significance Levels of Incidental Findings

Variable	Mann-Whitney Analyses & Correlations with IES-R Scores	Significant
Home ownership	U = 371.500, N1 = 39, N2 = 22, p = .380,	NS
Socio-economic status	U = 402.000, N1 = 25, N2 = 54, p = .721,	NS
Marital status	U = 393.500, N1 = 39, N2 = 22, p = .588,	NS
Parity	primiparous median = 6.5, range = 0-54 multiparous median = 2.5, range = 0-77 T1: U = 212.000, N1 = 24, N2 = 28, p = .021	0.05
	primiparous median = 5.5, range = 0-62, multiparous median = 0, range = 0-58) T2: U = 176.000, N1 = 24, N2 = 28, p = .004	0.05
Previous mental health problems	T1: U = 213.500, N1 = 15, N2 = 37, p = .189	NS
	T2: U = 240.000, N1 = 15, N2 = 37, p = .439	NS
Hospital experience	P = 0.70	NS
Time spent in hospital	T1: rho = .308, n = 59, p = .018	0.05
	T2: rho = .400, n = 50, p = .004	0.01
Time spent in SCBU	T1: rho = .314, n = 61, p = .014	0.05
	T2: rho = .243, n = 51, p = 0.82	NS

CHAPTER FOUR

DISCUSSION

This chapter will begin with a discussion of the main findings followed by a critique of the present study. The chapter will close with a discussion of the clinical implications of this piece of research and recommendations for future research.

4.1. Symptoms of Post-Traumatic Stress Disorder Following Childbirth.

The first hypothesis, that women can develop symptoms of post-traumatic stress disorder (PTSD) following childbirth was supported. One month after giving birth nine women out of 61 (14.8 per cent) had scores on the Impact of Events Scale - Revised, which represented clinical levels of distress. Three months after giving birth five women (9.6 per cent) out of 52 had scores on the Impact of Events Scale - Revised which represented clinical levels of distress. When the results were examined on an individual level it was found that five of the women (8.2 per cent) who had high scores for PTSD symptomatology one month after giving birth had low scores three months after giving birth. Four of the women (6.6 per cent) who had high scores one month after giving birth also had high scores three months after giving birth, and one woman (1.6 per cent) who did not have high scores one month after giving birth had high scores three months after giving birth. Therefore, the decrease in reported symptoms observed from one month to three months was as a result of a reduction of symptomatology, and not as a result of the women who had symptoms of PTSD at one month not responding at three months.

The literature review (Wijma et al, 1997., Creedy et al, 2000) on the subject of post-traumatic stress disorder following childbirth revealed prevalence rates ranging from 1.7 per cent to 5.6 per cent. The results of the current study would therefore appear rather high. The varying prevalence rates in the literature review probably reflect the different methods used to measure PTSD. In addition, one must make the distinction between reporting the prevalence of clinical PTSD and reporting the prevalence of symptoms of PTSD. In this study the Impact of Events Scale-Revised (IES-R) was used to measure PTSD symptoms. This is not a diagnostic tool, rather, it is a measure of symptom severity. The IES-R measures criteria B, C and D of DSM-IV criteria for PTSD, that is, it measures symptoms of intrusion, avoidance and hyperarousal. What it does not measure is whether the subject considered the event (childbirth) to involve actual or threatened death or serious injury, or a threat to the physical integrity of self or others, or whether the subjects response to the event involved fear, helplessness or horror (criterion A). Nor does it measure whether the disturbance (symptoms in criteria B, C and D) causes clinically significant distress or impairment in social, occupational, or other important areas of functioning (criterion F). Since the present study measured only criteria B, C and D, it is not surprising that prevalence rates were higher than if one measured for all the criteria for PTSD. Therefore, the findings from this research might indicate high levels of PTSD symptomatology rather than a diagnosis of PTSD following childbirth. However, high levels of symptomatology are clinically, if not diagnostically, important.

Another possible explanation for the relatively high symptom severity scores obtained in the present study may be related to the fact that there are currently no norms available for the IES-R. The cut-off used to indicate clinical levels of distress (scores >

25) in the present study was chosen based on advice from psychology colleagues who use the Impact of Events Scale in clinical practice (personal communication). This decision was backed up with evidence from the literature, which states that a cut-off of >25 is appropriate. (Olff et al 2005; Chemtob et al 1997). However, the Impact of Events Scale differs from the Impact of Events Scale – Revised in that it measures symptoms of Intrusion and Avoidance only. The IES-R is based on DSM-IV criteria for the diagnosis of PTSD and includes the original 15 – item pool, with the addition of seven items, which measure hyperarousal. Therefore, it is possible that a cut-off point of > 25 was too low once the hyperarousal sub-scale was added to the IES to create the IES-R. This may have contributed to the high prevalence rates of PTSD symptomatology found in the present study.

In summary, the results of the present study reveal that out of the sixty-one women studied, 14.8 per cent were suffering from symptoms of PTSD one month after giving birth. This figure fell to 9.6 per cent of the fifty-two women studied three months after giving birth. It was concluded that the prevalence rates in the present study were higher than those discussed in the literature review because it was PTSD symptomatology which was measured, as opposed to clinical PTSD. In addition, the cut-off point used to indicate clinical levels of distress in the present study may have been too low, resulting in higher rates of PTSD symptomatology in comparison to previous findings.

4.2. Symptoms of Post-Traumatic Stress and Level of Obstetric Intervention

The next step in the present study was to examine to what extent PTSD symptomatology was related to the level of obstetric intervention experienced by

women during labour and delivery. No significant differences in PTSD symptomatology were found between those who had their labour induced and those who did not; those who used pain relief and those who did not; or those who had an episiotomy and those who did not. Nor were significant difference found between those who had a natural birth and those who did not; those who had an instrumental delivery and those who did not; those who had an elective caesarean section and those who did not; or those who had an emergency caesarean section and those who did not. In addition no significant relationship was found between the total number of obstetric interventions experienced by women and their PTSD symptoms.

These findings are in accordance with those of Czarnocka and Slade (2002) and Lyons (1998). Czarnocka and Slade found no difference between those with PTSD symptoms and those without for nature of onset of labour, use of induction, type of pain relief, type of delivery or vaginal tear. They concluded that nature of interventions performed during labour or the nature of delivery appeared to be unimportant, and Lyons found that method of delivery or reported pain severity during labour and delivery were not significantly related to PTSD symptoms.

Fisher et al (1997) also found little evidence to support the notion that the total number of obstetric interventions was linked to deterioration in mood postpartum, but they point out that the most consistent findings in this area have come from studies which have specifically examined mode of delivery. These studies, such as those by Soderquist et al (2002) and Ryding et al (1998(1)) found that women who had an emergency caesarean section were more likely to experience negative psychological consequences postpartum. Soderquist et al (2002) found that PTSD symptom profiles

were more likely in women who had an emergency caesarean section or an instrumental delivery. Ryding et al found that these women had the most negative cognitions and emotions regarding their delivery one month postpartum compared to women who had an elective caesarean section or a normal vaginal delivery. These results can probably be explained by the fact that emergency caesarean sections and instrumental deliveries are responses to a threat to either the mother or the unborn infant. In addition, the mother has very little control over these situations and they are probably unexpected. Research in the field of PTSD has generally found that threat to life, feelings of lack of control and the occurrence of unexpected events all contribute to the development of the disorder. The findings of Soderquist et al (2002), that PTSD profiles were more likely in women who had an emergency caesarean section or an instrumental delivery, were not replicated in the present study. However, the small numbers in each delivery category may have influenced this finding.

When considering the relationship between obstetric interventions and psychological outcomes, it is also important to consider the diathesis-stress approach, where individual vulnerability interacts with events to determine outcome (Ayers, 2003). Ayers points out that if a woman has a high level of vulnerability, it is possible that an obstetrically 'normal' event, such as a spontaneous vaginal delivery, may be interpreted as traumatic because of subjective experience. On the other hand, a woman with low levels of vulnerability may recover quickly from a more objectively traumatising experience, such as an emergency caesarean section. Ayers argues that because of the variation in individual vulnerability and objective and subjective meanings, there is unlikely to be a simple linear relationship between obstetric

intervention and psychological outcomes. She suggests that the conflicting evidence regarding the role of obstetric events in PTSD supports her argument.

To summarise, no significant relationship was found between number of obstetric interventions and PTSD symptomatology in the present study. Nor was a significant difference found between mode of delivery and PTSD symptomatology. There are a number of explanations why this may be so. Firstly, the sample used in the present study may be too small to draw reliable conclusions from. Secondly, there may be no relationship between the variables (although more specific research suggests otherwise), or thirdly, as Ayers has argued, the subjective experience and the objective interpretation of an event are not comparable.

In conclusion, hypothesis two, that women who experienced more obstetric interventions would have more symptoms of PTSD compared to women who experienced fewer obstetric interventions, was not supported. This may have been because of the sample size in the present study, and / or because subjective and objective interpretations of an event are not always comparable.

4.3. Symptoms of PTSD and Health Locus of Control

The results of the present study revealed no significant association between health locus of control and frequency of PTSD symptoms. This result was unexpected given the body of research that exists which demonstrates a relationship between mothers' perceptions of being in control and their ratings of the birth as being satisfactory, or their perceptions of being out of control and their ratings of the birth as being

traumatic. (Wilmuth et al, 1978., Quine et al, 1993., Czarnocka and Slade, 2002). Based on this evidence one might expect that women with high internal health loci of control, that is, women who believe that their health status is controlled by what they themselves do, to have a greater perception of control over their labour and delivery and consequently significantly fewer symptoms of PTSD than women with external health loci of control. Women who have external health loci of control (or low internal loci of control) have a tendency to believe that their health status is largely down to chance or fate. Therefore, one might expect these women to feel less in control of their labour and delivery, and as a result be more prone to the development of symptoms of PTSD.

A possible explanation for the lack of a significant relationship between PTSD symptoms and locus of control in the present study may be related to the choice of measurement used. The present study used form A of the Multidimensional Health Locus of Control. Form A is a measure of subjects' general health locus of control beliefs and is usually used when studying relatively healthy samples. Form C on the other hand can be adapted to be condition specific and measures locus of control as it relates to a particular health problem. It does not provide a measure of general health locus of control. The rationale for using form A in the present study was that labour and delivery were not considered to be an illness or a health problem and therefore subjects' general health locus of control was measured instead. However, this may have been a mistake. More reliable results may have been obtained had subjects' been asked to consider their feelings with respect to their labour and delivery specifically. In addition, Wallston (1993) states that when using forms A or B to measure general

health locus of control, subjects' may not always know what the questionnaire is wanting from them.

In summary, no significant association was found between PTSD symptomatology and mothers' health loci of control therefore, hypothesis three, that women with a low internal locus of control would have more symptoms of PTSD than women with a high internal locus of control, was not supported. This may have been because women in the present study were not asked to consider their beliefs about being in control specifically in relation to their labour and delivery.

4.4. Symptoms of PTSD and Life Events

Results of the present study revealed a significant, positive relationship between the total number of life events experienced by mothers and PTSD symptoms. The significant difference emerged at one month following delivery and at three months following delivery. This result has been borne out in previous research (Cohen et al, 2004; Loveland Cook et al, 2002).

A positive and significant relationship was found between events that occurred during delivery (appendix 5) and PTSD symptomatology one month after delivery. This relationship was no longer significant at three months post-delivery. This suggests that what was being measured was a traumatic stress response to childbirth as opposed to symptoms of clinical PTSD. Symptoms of a traumatic stress response are not uncommon after an unusual event and tend to spontaneously abate shortly after the

event has taken place. The lack of a significant relationship between life events during childbirth and PTSD symptoms at three months postpartum suggests that that the symptoms of PTSD experienced by the 9.6 per cent of women three months after birth were probably not the direct result of events which took place during delivery. Another possible explanation for this result may be the fact that there were fewer life events relating to labour and delivery in the Life Events Inventory for New Mothers, compared to pre-birth and post-birth life events. This would make it less likely that a significant relationship between life events during labour and delivery would be detected using a statistical method where significance is reached by quantity. Alternatively, it may be that measuring the cumulative effect of life events across the perinatal period is more relevant than measuring each time period separately.

A positive and significant relationship was found between life events which took place one month post-delivery and symptoms of PTSD. These results remained significant at three months post-delivery. The significant relationship between postpartum life events and PTSD symptoms at three months post-delivery, along with the lack of a significant relationship between life events during childbirth and PTSD symptoms at the same stage suggest that it was not giving birth in itself that caused symptoms of PTSD, rather it was events which took place after labour and delivery.

Ayers (2003) pointed out that in postpartum PTDS research a particularly critical methodological issue is the need to take into account the fact that some women have PTSD predating childbirth. That is, women may have developed PTSD in pregnancy, or have a history of PTSD related to another trauma. In both cases, researchers need to take this into consideration when measuring symptoms of PTSD in relation to

childbirth. In the present study, life events prior to delivery, life events during delivery and life events-post delivery were measured. Results revealed that there was not a significant relationship between symptoms of PTSD and life events which took place prior to delivery at one month postpartum, or at three months postpartum. It is therefore probably safe to assume that any symptoms if PTSD identified in the present study are in relation to events which took place during labour and delivery or thereafter.

To summarise, hypothesis four, that is, women who experience more stressful life events will have more symptoms of PTSD than those who experience fewer stressful life events, was supported. When life events were divided into pre-delivery, during delivery and post-delivery, there was not a significant difference at one month or at three months for pre-delivery events. There was a significant difference for during-delivery life events at one month, but not at three months and there was a significant difference for pre-delivery events at one month and at three months.

In conclusion, there is a link between the number of life events in the perinatal period and PTSD symptomatology at one month and three months postpartum. However, when dividing life events into during-pregnancy, during delivery, or post-delivery, the effects are less clear and would benefit from further investigation.

4.5. Symptoms of PTSD and Baby's Admission to Special Care Baby Unit

One month after delivery mothers whose babies were admitted to the special care baby unit (SCBU) had significantly more symptoms of PTSD than those whose babies were not admitted to SCBU. Differences in symptoms of intrusion, avoidance and hyperarousal between mothers whose babies were admitted to SCBU and those whose were not, were examined independently and were all found to be significant at this time. However, the difference in PTSD symptoms between mothers whose babies were admitted to SCBU and those whose were not was no longer significant at three months following delivery. Nor were there significant differences between their intrusion, avoidance or hyperarousal sub-scores. Once again, it may be that it was a traumatic stress response that was measured one month following delivery. Alternatively, it may be that infants who had been admitted to SCBU after birth were no longer seriously ill three months later, and so mothers' PTSD symptoms abated. However, this explanation would be inconsistent with evidence cited by DeMier et al (1996). They reported on the psychological consequences for mothers of infants admitted to intensive care after birth and found that at both six months and eighteen months after their infants discharge, a large percentage of mothers described painful, intrusive and involuntary recollections of the stress of their hospital experiences. In addition, Holditch-Davis et al (2002) found that the mothers of premature infants admitted to a neonatal intensive care unit appeared to be experiencing emotional responses similar to post-traumatic stress reactions at six months after their infants expected birth date.

It may have been easier to interpret the results of the present study more readily had the reasons for admission to SCBU had been collected and the condition of the baby

been monitored. The majority of admissions to SCBU are as a result of premature births (personal communication), however, some infants are admitted briefly (e.g. for short observations of breathing difficulties, for scans, or to administer antibiotics). These variables may have been important in predicting the nature and extent of mothers' emotional responses.

To summarise, hypothesis five, that women whose babies were admitted to special care baby unit would have more symptoms of PTSD than mothers whose infants were not admitted, was supported one month after birth, but not at three months after birth. The reduction in PTSD symptomatology in mothers from one month to three months may reflect the recovery of the infants who were admitted to the special care baby unit for less serious procedures, or it may reflect the measurement of a traumatic stress response one month following delivery, which had abated three months following delivery.

4.6. Symptoms of PTSD and Co-morbid Anxiety and Depression

Results revealed that 11.5 percent of women had scores on the anxiety sub-scale of the Hospital Anxiety and Depression Scale (HADS) representing significant psychological morbidity one month after giving birth. This figure increased to 13.5 per cent three months after giving birth. With respect to the depression sub-scale, 11.5 per cent of women had scores representing significant levels of psychological morbidity one month after giving birth. This figure fell to 3.8 percent three months after giving birth. It is unclear what proportion of these women were anxious or depressed prior to giving

birth and so it is not possible to speculate on the extent to which the labour and delivery process contributed to these findings.

Mothers who had high scores on the IES-R had significantly higher anxiety scores than those who had low scores on the IES-R one month following delivery. This difference remained significant three months following delivery. Mothers who had high scores on the IES-R also had significantly higher depression scores one month following delivery. This difference was no longer significant three months following delivery.

These results are difficult to interpret given the high degree of symptom overlap between anxiety, depression and PTSD. However, the findings are consistent with previous research which demonstrated that anxiety and depression are common co-morbid conditions to PTSD (Creedy, 1999; Joseph et al, 1997).

Research has demonstrated that having experienced previous mental health problems may be a risk factor for the development of PTSD (Joseph et al 1997; Bailham and Joseph, 2003), so this factor was explored. No significant difference was found between the PTSD scores of those with previous mental health problems and those without previous mental health problems. However, when anxiety and depression were considered in relation to prior mental health problems it was found that those who had previous mental health problems had significantly higher anxiety and depression scores one month after giving birth. The significant difference in anxiety scores between mothers with and without a history of mental health problems remained at three months after birth, but the difference in depression scores was no longer significant three months after birth. Although PTSD was not identified as specific to this sub-

group of women, the results of the present study suggest that they are probably more prone to continuing mental health issues in the postpartum period.

In summary, hypothesis six, that mothers who have more symptoms of PTSD will also have more symptoms of anxiety and depression was partially supported. Mothers with more symptoms of PTSD did have significantly more symptoms of anxiety and depression at one month following delivery. Women with PTSD symptoms at three months were significantly more anxious but not depressed compared to women with fewer PTSD symptoms. Having a previous mental health problem did not differentiate between women with more PTSD symptoms and those with fewer PTSD symptoms. However, women with previous mental health problems were significantly more anxious and depressed one month after giving birth, and significantly more anxious but not depressed three months after giving birth. Given their history of mental health difficulties, these women are probably more prone to continuing mental health problems in the postpartum period.

4.7. Predictors of PTSD Symptoms Following Childbirth

A Logistic regression failed to produce a model that would predict the development of PTSD using the significant predictor variables obtained in the initial analyses, or the predictor variables that approached significance in the initial analysis. However, the small number of subjects in the present study may have rendered the analysis invalid.

4.8. Incidental Findings and PTSD Symptoms

There were no significant relationships identified between PTSD symptoms and the demographic variables of age, home ownership, occupational status or marital status. Nor was a significant relationship found between gestation period and PTSD symptoms. Statistical analysis investigating the relationship between mothers' perceptions of how supportive the person closest to her was and PTSD and symptoms was unfeasible due to small sample size.

A significant relationship was found between the length of time mothers and infants spent in hospital and PTSD symptoms at one month post-delivery. The relationship between infants stay in hospital and PTSD symptoms was no longer significant at three months post-delivery. This may be explained by the fact that at three months post-delivery, the health of infants who had been ill may have improved and their mothers' PTSD symptoms abated. The relationship between the length of the mothers stay in hospital and PTSD scores remained significant at three months post-delivery. The length of time mothers stayed in hospital may indicate the severity of their condition after giving birth. Unfortunately there was no data available relating to mothers' health status post-delivery in order to ascertain if this was related to the development of PTSD symptomatology.

Primiparous women had significantly more PTSD symptomatology than multiparous women. This had not been found in previous research. However Wijma et al (1997) found that there were proportionally more primiparous women in their PTSD group than multiparous women. Czarnocka and Slade (2000) reported that primiparous

women described being less prepared for labour and delivery, found the procedures during labour and delivery more unexpected, were more fearful for their baby and perceived their experience as worse than expected, compared to multiparous women. However, they did not differ significantly in levels of post-traumatic stress. The authors cautioned that there were much fewer multiparous women than primiparous women in their study, and said that their results should be interpreted accordingly. However, in the present study there were similar numbers of primiparous and multiparous women. Given primiparous women's lack of experience with labour and delivery, the findings of the present study may not be that unusual.

Fisher's exact test was carried out in order to examine the relationship between women's hospital experience and PTSD symptoms. Although no significant differences were detected, this result should be interpreted with caution. The 'as expected' data were combined with the 'worse that expected' and 'much worse than expected' data because otherwise there would have been inadequate numbers to permit a statistical analysis. Even if a significant difference had have been found, the way the data were collected may not have been appropriate. Asking subjects to indicate how they felt about their hospital experience was somewhat vague. It may have been more appropriate to ask subjects to rate how they found specific aspects of their stay in hospital, for example, how they found their labour and delivery, or the hospital staff etc.

4.9. Critique

There are a number of limitations to the present study that should be considered. Firstly, the use of research which relies on participants to complete and return questionnaires is often criticised. Return rates tend to be low and participants are usually middle class and more literate, and so may not be representative of the general population. In addition, it may be that more distressed individuals are less inclined to participate in this kind of research.

Ayers (2001) points out that the problem with using symptom measures of PTSD, such as the Impact of Events Scale, is that they are unable to establish what proportion of women develop clinical PTSD as a result of childbirth. She argues that looking at the relationship between PTSD symptoms and other variables is an analogue design in which variables thought to be important in clinical cases of PTSD are inferred from their relationship with symptoms. The gold standard for establishing rates of clinical PTSD is to use interviews conducted by trained clinicians. However, this was beyond the scope of the present study.

A number of weaknesses in the assessment tools used in the present study became apparent. Firstly, definitions of the various types of delivery should have been included in the section where mothers were asked to indicate how their baby was delivered as it became clear that participants had different ideas about what constituted a natural delivery. In addition, the use of additive scores of obstetric interventions would appear to be flawed. By combining certain highly stressful procedures with ones that may not be distressing, it is possible that the impact of some procedures were 'diluted'. It may

have been more appropriate to consider mode of delivery in isolation, since Fisher et al (1997) argue that the most consistent findings relating to the role of obstetric variables come from studies which have specifically measured mode of delivery.

The assessment of mothers' hospital experiences used in the present study was rather crude and some important information may have been missed as a result. It would have been more helpful to ask mothers to rate their experiences of specific aspects of their time in hospital as opposed to their overall experience in hospital.

In order to gain a clear picture of the impact of labour and delivery, research in this area should ideally be prospective in nature. Although it was possible to ascertain that life events which occurred prior to labour and delivery were unrelated to symptoms of PTSD in the present study, it was not possible to distinguish individuals who were anxious and depressed prior to labour and delivery from those who developed anxiety and depression following labour and delivery. It would have been useful to include some measures of stable personality traits, such as the trait section of the State-Trait Anxiety Inventory, in order to gain a clearer understanding of the variables that contribute to the development of PTSD.

4.10. Clinical Implications

The results of the present study, especially when considered in conjunction with previous research, highlight the need for maternity staff to be aware that a significant proportion of women may develop traumatic stress symptoms following childbirth. In addition many of the women in the present study were suffering from symptoms of

moderate to severe anxiety and depression in the postpartum period. Training in recognition and assessment of mental health problems in post-natal mothers is increasingly occurring for midwives and health visitors, and the results of the present study could form part of that training. It is important to take a detailed history from pregnant women in order to identify those at risk of developing postpartum PTSD, and the results of the present study suggest that women with past mental health problems and / or those who have experienced a high number of life events may be particularly vulnerable. In addition, a careful assessment of the mothers' emotional state post-delivery is also important. According to the results of the present study, events which occur during the birth may cause distress in the short term, whereas events which take place after delivery may cause more pervasive distress. Given that many of the symptoms of PTSD overlap with symptoms of anxiety and depression, it is important that a careful assessment of mothers' emotional state is made in order to make a distinction between the symptoms. In this way the mother will stand a better chance of receiving appropriate interventions for her difficulties. However, it must be remembered not to pathologise postnatal distress and adjustment as it is normal for women to think about their labour and delivery for some time afterwards, indeed it may be cathartic for them to do so. As demonstrated in this study, a proportion of women who experiences initial symptoms of PTSD will recover spontaneously, and so due caution should be exercised before labelling these women with a mental health problem.

The usefulness of postnatal groups, where women could have the opportunity to share their birth experiences should be considered. Many mothers may find this a 'normalising' experience and come away from the group feeling reassured about any

recurrent thoughts or feelings she was experiencing in relation to her labour and delivery. However, it would be important that such groups are carefully evaluated in order to monitor their efficacy.

The present study has demonstrated that a number of assessment tools, namely the Impact of Events Scale – Revised and the Hospital Anxiety and Depression Scale, are efficient and inexpensive ways for midwives and health visitors to assess the mental health status of women in the perinatal period. Symptomatic women can be quickly identified and referred on to specialist services if necessary.

4.11. Future Research

There is always a need for more prospective, longitudinal studies using trained clinicians to collect data in the field of clinical psychology, and the same is true with respect to the subject of the development of PTSD following childbirth. Follow-up studies would help determine what proportion of women continue to suffer from symptoms of PTSD long after they have given birth. In addition, studies examining the occurrence of PTSD and postnatal depression and anxiety might be helpful in disentangling the symptomatology.

Given that PTSD following childbirth is beginning to be recognised as a legitimate occurrence, future research should focus on developing well standardised means of assessing the disorder. Alternatively, an existing measure of PTSD could be validated to use with obstetric populations. The Impact of Events Scale – Revised would appear to be a good option, however more work needs to be carried out in order to ascertain an

optimum cut-off score. Similar tools already exist for postnatal depression, such as the Edinburgh Postnatal Depression Scale. A PTSD tool could be used as part of a battery of tests to assess postnatal mood.

The effects of postnatal depression on the infant is an area that has received considerable attention. The effects of maternal depression on the infant has been associated with a increased risk for difficulties in emotion regulation, insecure attachment, problem behaviours, and delays in the acquisition of competencies (Carter et al, 2001). Anxiety disorders are also being increasingly documented with recent studies suggesting that prinatal anxiety may be as common as perinatal depression (Austin and Priest, 2004). Future research could also be directed towards examining the short and long-term effects of maternal PTSD on infant development and behaviour. This is important with changes in the provision of mental health services for new mothers under the Mental Health (Scotland) Act (2004).

Finally, much work still has to be done to identify vulnerability factors in the development of postnatal PTSD. Discovering these vulnerability factors would allow preventative strategies, such as screening for these factors during pregnancy, to be implemented and evaluated.

4.12. Summary and Conclusions

This study provides further evidence that women do report symptoms indicative of post-traumatic stress disorder at one month and three months following childbirth.

Obstetric interventions, locus of control or life events which occurred prior to labour and delivery do not appear to contribute to the aetiology. Events which occurred during labour and delivery significantly differentiated women with more PTSD symptoms from those with fewer symptoms at one month but not at three months post-delivery. However, this may have been because fewer labour and delivery events were measured in comparison with post-birth events. Events which occurred after delivery significantly differentiated women with PTSD symptomatology from those with no symptomatology at one month and three months post-delivery. Mothers whose infants were admitted to the special care baby unit had significantly more symptoms of PTSD than those whose infants were, not at one month, but not three months following delivery. The recovery of some infants between one month and three months may have contributed to the reduction of mothers' symptomatology. Women who had higher scores on the Impact of Events Scale had significantly higher anxiety and depression scores at one month post-delivery, however, only anxiety scores remained significant at three months post-delivery. Anxiety and depression in the postpartum period was associated with previous mental health problems.

Caution should be exercised before diagnosing a woman with postpartum PTSD given that a proportion of women's symptoms spontaneously abate. Post-natal groups may be an effective way for women to share their experiences of labour and delivery and normalise any negative emotions they may be experiencing in the first instance.

The Impact of Events Scale and the Hospital Anxiety and Depression Scale appear to be effective and inexpensive tools for midwives and health visitors to evaluate the

mental health status of postpartum women. However, more research is needed to establish optimum cut-off points for the scale.

It is suggested that future research be directed towards examining vulnerability factors pertaining to the development of postpartum PTSD, developing standardised measures of postpartum PTSD and considering the implications of maternal PTSD on the infant.

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APPENDIX 1

DSM-IV Diagnostic Criteria for PTSD

Table 1: DSM-IV Criteria for PTSD

A) The person has been exposed to a traumatic event in which both the following were present:

(1)   The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others

(2)   The person's response involved fear, helplessness, or horror.

B) The traumatic event is persistently re-experienced in one (or more) of the following ways:

(1)   Recurrent and intrusive distressing recollections of the event, including images, thoughts or perceptions.

(2)   Recurrent distressing dreams of the event.

(3)   Acting or feeling as if the traumatic event were recurring.

(4)   Intense psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event.

(5)   Physiological reactivity on exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event.

C) Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

(1)   Efforts to avoid thoughts, feelings, or conversations associated with the trauma

(2)   Efforts to avoid activities, places, or people that arouse recollections of the trauma.

(3)   Inability to recall an important aspect of the trauma.

(4)   Markedly diminished interest or participation in significant activities.

(5)   Feeling detachment or estrangement from others.

(6)   Restricted range of affect.

(7)   Sense of foreshortened future

Table 1: DSM-IV Criteria for PTSD Continued

D) Persistent symptoms of increased arousal (not present before the trauma) as indicated by two or more of the following:

(1)   Difficulty falling or staying asleep.

(2)   Irritability or outbursts of anger.

(3)   Difficulty concentrating.

(4)   Hypervigilance.

(5)   Exaggerated startle response

E) Duration of the disturbance (symptoms in criteria B, C and D) is more than one month.

F) The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

APPENDIX 2

The Impact of Events Scale – Revised

THE IMPACT OF EVENTS SCALE - REVISED

Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you DURING THE PAST SEVEN DAYS with respect to your labour and the delivery of your last baby.

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
Any reminder brought back feelings about it	0	1	2	3	4
I had trouble staying asleep because thoughts about it came into my mind	0	1	2	3	4
Other things kept making me think about it	0	1	2	3	4
I felt irritable and angry	0	1	2	3	4
I avoided letting myself get upset when I thought about it or was reminded of it	0	1	2	3	4
I thought about it when I didn't mean to	0	1	2	3	4
I felt as if it hadn't happened or wasn't real	0	1	2	3	4
I stayed away from reminders about it	0	1	2	3	4
Pictures about it popped into my head	0	1	2	3	4
I was jumpy and easily startled	0	1	2	3	4
I tried not to think about it	0	1	2	3	4
I was aware that I still had a lot of feelings about it, but didn't deal with them	0	1	2	3	4

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
My feelings about it were kind of numb	0	1	2	3	4
I found myself acting or feeling as though I was back at that time	0	1	2	3	4
I had trouble falling asleep because thoughts about it came into my mind	0	1	2	3	4
I had waves of strong feelings about it	0	1	2	3	4
I tried to remove it from my memory	0	1	2	3	4
I had trouble concentrating	0	1	2	3	4
Reminders of it caused me to have physical reactions, such as trouble breathing, nausea, or a pounding heart	0	1	2	3	4
I had dreams about it	0	1	2	3	4
I felt watchful or on-guard	0	1	2	3	4
I tried not to talk about it	0	1	2	3	4

Thank you

APPENDIX 3

The Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS)

NFER-NELSON
INFORMING YOUR DECISIONS

Name: _____   Date: _____

Clinicians are aware that emotions play an important part in most illnesses. If your clinician knows about these feelings he or she will be able to help you more.

This questionnaire is designed to help your clinician to know how you feel. Read each item below and **underline the reply** which comes closest to how you have been feeling in the past week. Ignore the numbers printed at the edge of the questionnaire.

Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response.

FOLD HERE

FOLD HERE

A D

I feel tense or 'wound up'
- Most of the time — `3`
- A lot of the time — `2`
- From time to time, occasionally — `1`
- Not at all — `0`

I still enjoy the things I used to enjoy
- Definitely as much — `0`
- Not quite so much — `1`
- Only a little — `2`
- Hardly at all — `3`

I get a sort of frightened feeling as if something awful is about to happen
- Very definitely and quite badly — `3`
- Yes, but not too badly — `2`
- A little, but it doesn't worry me — `1`
- Not at all — `0`

I can laugh and see the funny side of things
- As much as I always could — `0`
- Not quite so much now — `1`
- Definitely not so much now — `2`
- Not at all — `3`

Worrying thoughts go through my mind
- A great deal of the time — `3`
- A lot of the time — `2`
- Not too often — `1`
- Very little — `0`

I feel cheerful
- Never — `3`
- Not often — `2`
- Sometimes — `1`
- Most of the time — `0`

I can sit at ease and feel relaxed
- Definitely — `0`
- Usually — `1`
- Not often — `2`
- Not at all — `3`

A D

I feel as if I am slowed down
- Nearly all the time — `3`
- Very often — `2`
- Sometimes — `1`
- Not at all — `0`

I get a sort of frightened feeling like 'butterflies' in the stomach
- Not at all — `0`
- Occasionally — `1`
- Quite often — `2`
- Very often — `3`

I have lost interest in my appearance
- Definitely — `3`
- I don't take as much care as I should — `2`
- I may not take quite as much care — `1`
- I take just as much care as ever — `0`

I feel restless as if I have to be on the move
- Very much indeed — `3`
- Quite a lot — `2`
- Not very much — `1`
- Not at all — `0`

I look forward with enjoyment to things
- As much as I ever did — `0`
- Rather less than I used to — `1`
- Definitely less than I used to — `2`
- Hardly at all — `3`

I get sudden feelings of panic
- Very often indeed — `3`
- Quite often — `2`
- Not very often — `1`
- Not at all — `0`

I can enjoy a good book or radio or television programme
- Often — `0`
- Sometimes — `1`
- Not often — `2`
- Very seldom — `3`

Now check that you have answered all the questions

A D

TOTAL [ ]

APPENDIX 4

The Multidimensional Health Locus of Control

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1=STRONGLY DISAGREE (SD)	4=SLIGHTLY AGREE (A)
2=MODERATELY DISAGREE (MD)	5=MODERATELY AGREE (MA)
3=SLIGHTLY DISAGREE (D)	6=STRONGLY AGREE (SA)

		SD	MD	D	A	MA	SA
1	If my condition worsens, it is my own behavior which determines how soon I will feel better again.	1	2	3	4	5	6
2	As to my condition, what will be will be.	1	2	3	4	5	6
3	If I see my doctor regularly, I am less likely to have problems with my condition.	1	2	3	4	5	6
4	Most things that affect my condition happen to me by chance.	1	2	3	4	5	6
5	Whenever my condition worsens, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am directly responsible for my condition getting better or worse.	1	2	3	4	5	6
7	Other people play a big role in whether my condition improves, stays the same, or gets worse.	1	2	3	4	5	6
8	Whatever goes wrong with my condition is my own fault.	1	2	3	4	5	6
9	Luck plays a big part in determining how my condition improves.	1	2	3	4	5	6
10	In order for my condition to improve, it is up to other people to see that the right things happen.	1	2	3	4	5	6
11	Whatever improvement occurs with my condition is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my condition is what I myself do.	1	2	3	4	5	6
13	I deserve the credit when my condition improves and the blame when it gets worse.	1	2	3	4	5	6
14	Following doctor's orders to the letter is the best way to keep my condition from getting any worse.	1	2	3	4	5	6
15	If my condition worsens, it's a matter of fate.	1	2	3	4	5	6
16	If I am lucky, my condition will get better.	1	2	3	4	5	6
17	If my condition takes a turn for the worse, it is because I have not been taking proper care of myself.	1	2	3	4	5	6
18	The type of help I receive from other people determines how soon my condition improves.	1	2	3	4	5	6

APPENDIX 5

The Life Events Inventory for New Mothers

LIFE EVENTS INVENTORY FOR NEW MOTHERS

Listed below are 42 events that have happened to some women before or after the birth of a baby. Please answer each statement depending on whether it has happened or has not happened to you.

If the answer is **YES** the thing has happened please circle **YES**.
If the answer is **NO** the thing has not happened please circle **NO**.

For some statements the event could have happened before or after your baby was born. For these statements circle BEFORE BIRTH if it happened before your baby was born and/or AFTER THE BIRTH if the event happened after your baby was born. If the event occurred **before** your baby was born please state approximately when it occurred, e.g. 1 week before, 3 years before etc. Don't worry if you can't remember exactly when something happened – a rough guide is all we need.

1. The labour/delivery was very painful   **YES   NO**

2. There were problems in your sexual relationship   **YES   NO**
   If YES was it   Before birth / After birth
                                   If before how long before?

3. Your baby was abnormal   **YES   NO**

4. You were told by your husband/partner that you were no longer loved
                                         YES   NO
   If YES was it   Before birth / After birth
                                   If before how long before?

5. You separated from your husband/partner   **YES   NO**
   If YES was it   Before birth / After birth
                                   If before how long before?

6. Medical complications arose during the delivery   **YES   NO**

7. Your husband's/partner's business failed   **YES   NO**
    If YES was it   Before birth / After birth
                                               If before how long before?

8. A major financial crisis arose   **YES   NO**
    If YES was it   Before birth / After birth
                                               If before how long before?

9. You were separated from your family or a close friend
                                                       YES   NO
    If YES was it   Before birth / After birth
                                               If before how long before?

10. A new person came to live in your household (not baby)
                                                       YES   NO
    If YES was it   Before birth / After birth
                                               If before how long before?

11. Breastfeeding was difficult to establish   **YES   NO**

12. You developed piles   **YES   NO**
    If YES was it   Before birth / After birth
                                               If before how long before?

13. You had stitches and were uncomfortable for a long time after the
    delivery   **YES   NO**

14. A child of yours died   **YES   NO**
    If YES was it   Before birth / After birth
                                               If before how long before?

15. Your husband/partner died   **YES   NO**
    If YES was it   Before birth / After birth
                                               If before how long before?

16. Someone close to you (in your family or outside) died

YES   NO

If YES was it   Before birth / After birth

If before how long before?

17. Your baby needed some special treatment after the birth

YES   NO

18. Your husband/partner was not present at the birth

YES   NO

19. You had to have an anaesthetic during the delivery and were not awake when your baby arrived   **YES   NO**

20. Your baby was very small at birth   **YES   NO**

21. The labour/delivery had to be induced   **YES   NO**

22. You moved house   **YES   NO**

If YES was it   Before birth / After birth

If before how long before?

23. Your husband/partner became unemployed   **YES   NO**

If YES was it   Before birth / After birth

If before how long before?

24. Increasingly serious arguments developed with your mother

YES   NO

If YES was it   Before birth / After birth

If before how long before?

25. Someone close to you (in the family or outside) developed a serious illness   **YES   NO**

If YES was it   Before birth / After birth

If before how long before?

26. Your baby was not the sex you hoped for   YES   NO

27 Your baby arrived before the expected date   YES   NO

28. Your baby arrived after the expected date   YES   NO

29. Increasingly serious arguments developed between you and your
husband/partner   YES   NO
If YES was it   Before birth / After birth
       If before how long before?

30. You had difficulty in arranging for someone to look after your family
whilst in hospital   YES   NO

31. You were severely constipated   YES   NO
If YES was it   Before birth / After birth
       If before how long before?

32. Your baby had a birthmark or something similar spoiling his/her
appearance   YES   NO

33. You had a caesarean operation   YES   NO
If YES was it   Elective/Emergency

34. You had a serious illness or were badly injured and had to be off work
and/or in hospital for at least a month   YES   NO
If YES was it   Before birth / After birth
       If before how long before?

35. You developed varicose veins   YES   NO
If YES was it   Before birth / After birth
       If before how long before?

36. You started a new job   **YES NO**

       If YES was it   Before birth / After birth

                     If before how long before?

37. Increasingly serious arguments developed with your in-laws

                     YES NO

       If YES was it   Before birth / After birth

                     If before how long before?

38. You were involved in legal action which could have damaged your reputation   **YES NO**

       If YES was it   Before birth / After birth

                     If before how long before?

49. Your husband/partner was unfaithful   **YES NO**

       If YES was it   Before birth / After birth

                     If before how long before?

40. You were the cause of a traffic accident in which someone was badly injured   **YES NO**

       If YES was it   Before birth / After birth

                     If before how long before?

41. You had recurrent urinary tract infections   **YES NO**

       If YES was it   Before birth / After birth

                     If before how long before?

42. You had blood pressure trouble   **YES NO**

       If YES was it   Before birth / After birth

                     If before how long before?

Please indicate whether the one person closest to you (e.g. partner / mother) was supportive during this time, and note down the relation of this person to you   **supportive / not supportive**

This person is my_____

THANK YOU FOR ALL YOUR HELP

APPENDIX 6

General Information Questionnaire

Your Individual Code Number is:_____

GENERAL INFORMATION QUESTIONNAIRE

1. Today's date: _____

2. What is your occupation?   _____

3. Where are you living at the moment?   (please tick)

- **Own home** ☐

- **Rented accommodation** ☐

- **Council accommodation** ☐

- **Other (Please state)**_____

4. What is your marital status? (Please tick all relevant descriptions)

Married ☐

Separated ☐

Divorced ☐

In a relationship with baby's father ☐

In a relationship, but not with baby's father ☐

Not currently in a partnership ☐

5. When was your baby delivered? (e.g. 38 weeks, 40 weeks etc)

_____ weeks.

6. Did your baby spend any time in the   (Please circle)

Special Care Baby Unit?   Yes   No
If yes, how long was your baby in the Special Care Baby Unit?

7. How long was your stay in Hospital? _____

8. How was your baby delivered (Please tick all that apply)

Natural birth	Used pain relief (please state type of pain relief used)		Induced delivery		Did you have stitches?
Instrumental delivery e.g. forceps	Elective caesarean section		Emergency caesarean section		

9. We would like to know how you feel about your time in hospital.

Please tick as appropriate

- It was much worse than I expected ☐

- It was worse than I expected ☐

- It was what I expected ☐

- It was better than I expected ☐

- It was much better than I expected ☐

10. How many children do you have *including* your new baby? ☐

Please Circle

11. Have you ever been treated by your GP or any other health care professional for mental health problems e.g. depression or anxiety?   Yes   No

12. Would you like me to send you a summary of the results of this research?

Yes   No

THANK YOU FOR YOUR TIME

APPENDIX 7

Information Sheet

Area Clinical Psychology Service
New Craigs
6-16 Leachkin Road
Inverness IV3 8NP
Telephone 01463 704000
Fax 01463 704686

Enquiries to: Dee McDonnell
Extension:
Email: mcdonnelldee@hotmail.com

NHS
Highland

Information sheet

Childbirth and the Development of Post-Traumatic Stress Symptoms: An Examination of Prevalence and Possible Contributing Factors

Thank you for reading this

You are being asked to take part in a research study. Before you decide whether or not to take part it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

Being admitted to hospital can be a stressful time and although some degree of stress is normal and short lived, for some women symptoms of stress and anxiety can persist after their hospital visit. This study aims to look at the number of women who go on to develop symptoms of stress after being admitted to hospital and attempts to find out what factors increase the chances of becoming stressed.

Why have I been chosen?

Working with you to make Highland the healthy place to be

All women who gave birth in Raigmore Hospital in January 2005 have been invited to take part in the study

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive.

What will happen to me if I take part?

Participation in this study involves completing a few short questionnaires a day or two after the hospital procedure for which you have been admitted has taken place. The questionnaires will take less than 55 minutes to complete and all the information you provide will be confidential. We will contact you by post 3 months later and ask you to complete the questionnaires once more

What are the possible benefits of taking part?

You may not benefit directly by taking part in this study, however, the results of this study may help in identifying and preventing excessive stress in patients in the future.

Will my taking part in this study be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential. Any information will have names and addresses removed so that no one can be recognised from it. If you choose to take part in the study I would appreciate it if you would grant me your consent to inform your GP that you are participating in this study.

What will happen to the results of the research study?

The results of the study will be written up in the form of a thesis and submitted to the University of Edinburgh in part fulfilment of the doctorate in clinical psychology course. All identifying information about to you will be removed.

Who has reviewed the study?

The Highland NHS Board Ethics Committee has reviewed this study.

Contact for further information

Dee McDonnell
Trainee Clinical Psychologist
Department of Clinical Psychology
New Craigs Hospital
1-16 Leachkin Road
Inverness
IV3 8NP
Telephone: 01463 704683

If you would like to contact an independent advisor with any questions regarding this study please contact Dr Louise Blackmore at the following address

Department of Clinical Psychology

New Craigs

1-16 Leachkin Road

Inverness

IV3 8NP

Telephone: 01463 704683

If you decide to take part in the study please complete the enclosed questionnaires and return them in the envelope provided. We will write to you at your home in 3 months and ask you to fill out the questionnaires once more.

If you would like to participate please sign the enclosed consent form and return it with your completed questionnaires

Thank you very much for your time.

Yours sincerely

Dee McDonnell
Trainee Clinical Psychologist

APPENDIX 8

Consent Form

CONSENT FORM

I have read the patient information sheet on the above study.

I have agreed to take part in the study as it has been outlined to me, but I understand that I am completely free to withdraw from the study at any time I wish and that this will not affect my continuing medical treatment in any way.

I understand that this study has been reviewed by the Highland Research Ethics Committee and may be of no benefit to me personally. I also understand that my General Practitioner will be informed that I have taken part in this study.

I hereby fully and freely consent to participate in the study which has been fully explained to me.

Signature of Patient:_____

        Date:_____

Signature of investigator:_____

        Date:_____

Working with you to make Highland the healthy place to be

Chairman: [To be appointed]
Chief Executive: Dr Roger Gibbins BA MBA PhD

NHS Highland, Assynt House, Beechwood Park, INVERNESS
IV2 3HG
Highland NHS Board is the common name of Highland Health Board

APPENDIX 9

Cover Letter

Highland Primary Care NHS Trust

Area Clinical Psychology
Service
New Craigs
6-16 Leachkin Road
Inverness IV3 8NP
Telephone 01463 704683
Fax 01463 704686

Enquiries to: Dee McDonnell

Email: mcdonnelldee@hotmail.com

Childbirth and the Development of Post-Traumatic Stress Disorder: An Examination of Prevalence and Possible Contributing Factors

Dear Participant,

Thank you for completing and returning the questionnaires I sent you in February 2005. Your co-operation is very much appreciated. Please find enclosed some more questionnaires for you to complete. These are the last batch of questionnaires you will receive and they will only take approximately 5-10 minutes to complete. I would be grateful if you could return them in the stamped addressed envelope provided as soon as possible.

Your help during this busy time in your life is much appreciated.

Yours sincerely

Dee McDonnell
Trainee Clinical Psychologist