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What makes labour and birth traumatic? A survey of intrapartum ‘hotspots’

Between 1 and 6% of women develop posttraumatic stress disorder (PTSD) after childbirth. ‘Hotspots’ are moments of extreme distress during traumatising events that are implicated in symptoms of PTSD. This paper reports a cross sectional internet survey of hotspots that examined (1) the content of intrapartum hotspots and (2) whether particular events, cognitions or emotions during hotspots are related to PTSD. Women (N=675) who experienced a difficult or traumatic birth completed a questionnaire composed of a validated measure of PTSD, questions concerning the existence of hotspots, and a newly developed measure of emotions and cognitions during hotspots. The majority of women (67.4%) reported at least one hotspot during birth and 52.9% had re-experiencing symptoms of these hotspots. Women were more likely to have PTSD if hotspots involved fear and lack of control (OR 1.30, 95% CI 1.17 – 1.43) or intrapartum dissociation (OR 1.12, 95% CI 1.05 – 1.19). Risk of PTSD was higher if hotspots concerned interpersonal difficulties (OR 4.34, 95% CI 2.15 - 8.77) or obstetric complications (OR 3.35, 95% CI 1.64 – 6.87) compared to complications with the baby.

Keywords: PTSD, birth, labour, fear, dissociation, support

Introduction

There is evidence that between 20 and 48 percent of women rate childbirth as traumatic and many of these women report some symptoms of posttraumatic stress disorder (PTSD) (Alcorn, O'Donovan, Patrick, Creedy, & Devilly, 2010; Ayers, Harris, Sawyer, Parfitt, & Ford, 2009). An overview of research in this area reported prevalence rates of PTSD after birth of up to 6.9 percent (Ayers, Joseph, McKenzie-McHarg, Slade & Wijma, 2008) with an incidence of between 1.5 and 3.1 percent (Alcorn, et al., 2010; Ayers & Pickering, 2001). PTSD involves symptoms of increased arousal, persistent avoidance of reminders and intrusive re-experiencing of an event. Diagnostic criteria state that for an event to be traumatic a person has to perceive that their own or another person's life or physical integrity is threatened, and respond with intense fear, helplessness, or horror (DSM-IV criterion A) (American Psychiatric Association, 2000).

Research examining what makes birth traumatic tends to take one of two approaches. The majority of research has looked at factors that are associated with postpartum PTSD, such as psychiatric history or type of delivery. This approach makes a-priori assumptions about which factors are likely to be important. The typical methodology is cross-sectional or prospective questionnaire studies of pregnant/postpartum women. This research broadly finds that postpartum PTSD is related to prepartum factors such as a history of psychiatric problems, previous trauma, antenatal anxiety/fear of childbirth, primiparity and intrapartum factors such as intrapartum dissociation, assisted or emergency caesarean deliveries, although it should be noted that women who have an unassisted vaginal birth are still at risk (Ayers, 2004; Olde, Van der Hart, Kleber, & Van Son, 2006). Other intrapartum factors such as pain, blood loss, duration, and sum of interventions, have been inconsistently associated with PTSD symptoms (Ayers, 2004; Tedstone & Tarrier, 2003).

A second approach to examining what makes birth traumatic is a qualitative one, where women who have experienced a traumatic birth are asked to recount their birth experience and themes are extracted (Allen, 1998; Ayers, 2007; Ayers, Eagle, & Waring, 2006; Beck, 2004b; Beck, 2004a; Beck, 2006; Beck & Watson, 2008; Moyzakis, 2004; Nicholls & Ayers, 2007; Thompson & Downe, 2008). A recent meta-ethnographic review of these studies found four themes which involved intrapartum factors. These were women (i) feeling invisible and out of control, (ii) feeling trapped, (iii) being treated inhumanely, and (iv) reporting a 'rollercoaster of emotions' (Elmir, Schmied, Wilkes, & Jackson, 2010).

Quantitative studies usually find that assisted deliveries or emergency caesarean are associated with PTSD (Ayers, et al., 2009; Creedy, Shochet, & Horsfall, 2000; Soderquist, Wijma, & Wijma, 2002) although there is some inconsistency (Czarnocka & Slade, 2000; Skari, et al., 2002; Soet, Brack, & Dilorio, 2003; Wijma, Soderquist, & Wijma, 1997). Qualitative studies suggest this inconsistency may be due to other intrapartum factors, such as level of support or interpersonal difficulties (Elmir, et al., 2010). It is therefore clear that the obstetric severity of birth events alone does not determine whether women develop PTSD. It is likely to be the interplay between events and women's perceptions and emotions during birth that are critical in the onset of PTSD. To date, only one study has examined women's perceptions and emotions during birth and PTSD. This was a qualitative study that compared descriptions of birth events from women with and without symptoms of PTSD three months after birth (Ayers, 2007). Results found that women with PTSD reported more anger, panic, thoughts of death, mental defeat and intrapartum dissociation during birth than women with no PTSD symptoms. However, this study was based on women's descriptions of the whole birth experience and did not explicitly focus on traumatic moments during birth.

Another way to examine what makes birth traumatic is to focus on moments of extreme distress or perceived threat during birth. These have been described in the trauma

literature as peritraumatic “hotspots” (Grey & Holmes 2008; Grey, Homes & Brewin, 2001; Grey, Young & Holmes, 2002; Holmes, Grey & Young, 2005) or “pathogenic kernels” (Van der Hart, Nijenhuis & Steele, 2006). Here we use the term hotspots to denote “specific parts of the trauma memory that cause highest levels of emotional distress” (Holmes et al., 2005). These hotspots or pathogenic kernels are strongly implicated in re-experiencing symptoms of PTSD. For example, Holmes et al., (2005) found that 78 per cent of intrusive thoughts and images involved hotspots. This suggests that understanding more about the content of hotspots may be important in preventing re-experiencing symptoms of PTSD.

Hotspots are also commonly identified and used during psychotherapy. This enables a therapist to focus therapy on those moments that evoke most distress; and provides insight into the type of events that are experienced as most distressing. Studies of “hotspots” in patients being treated for PTSD suggests important themes may be: lack of control and reasoning; general threat of injury and death; uncertain threat; consequences of the event; cognitive avoidance; abandonment; and esteem threat (Holmes, Grey, & Young, 2005). Common emotions reported are fear, anger and sadness (Grey & Holmes, 2008; Holmes, et al., 2005).

The study of hotspots is therefore a useful way to examine which events during birth women find particularly traumatic, and the cognitions and emotions most clearly associated with moments of peak distress and therefore with traumatic birth. Despite this, only a handful of studies have examined hotspots and these have all been carried out in small, clinical samples (Grey & Holmes, 2008; Grey, Young, & Holmes, 2002; Holmes, et al., 2005; Jelinek, et al., 2010). No published studies have looked at hotspots during birth. The study reported in this paper therefore had two broad aims: (i) to determine whether women report hotspots during birth experiences and explore the content of hotspots i.e. what types of events

during birth are most likely to incur hotspots? (ii) To examine whether particular events, cognitions or emotions during hotspots are related to increased likelihood of PTSD.

Method

Design and methods

This was a cross-sectional internet survey of the frequency of hotspots, content of hotspots, cognitions and emotions during hotspots; and PTSD symptoms in women who had difficult or traumatic experiences of birth. Ethical approval was obtained from the university research ethics committee. Women were eligible if they were over 18, had given birth and could read and write fluently in English. As traumatic births only occur in a minority of women, participants ($n = 699$) were purposively recruited from internet support groups (e.g. Yahoo health and Facebook groups) and charity websites aimed at women who experienced difficult or traumatic births (e.g. www.birthtraumaassociation.org.uk). Information was also sent via email to midwives and researchers working in the area to pass on to postpartum women. Questionnaires were completed online between January and June 2008. Those with substantial missing data (e.g. a whole measure not completed) were excluded ($n = 24$). The final sample therefore consisted of 675 women aged between 19 and 66 years (mean = 31.55, SD = 6.58). Participants were predominantly white European (98.6%) and married or cohabiting (93.6%). Parity was fairly evenly split between primiparous (53.4%) and multiparous women. A large proportion of women had caesareans (32.1%) or assisted delivery (27.4%), and reported previous traumatising events, such as assault (sexual and nonsexual), accidents and disasters (45.6%). However, previous traumatising events were not associated with hotspots. Length of time since the birth varied considerably (range 2.53 - 565.97 months; mean = 42.73, SD = 62.95). However, time since birth was not correlated with hotspots or PTSD symptoms.

Measures were carefully chosen for validity and applicability to this sample. PTSD was measured using the PTSD Diagnostic Scale (PDS; Foa, 1995) adapted slightly to measure PTSD in relation to childbirth. The PDS can be used as a measure of symptom severity or diagnosis. For a diagnosis of PTSD women had to report significant perceived threat of death or injury for themselves or another; respond with helplessness or terror; report 1 or more re-experiencing symptoms; 3 or more avoidance and numbing symptoms; and 2 or more arousal symptoms. Symptoms had to last for at least 1 month and cause significant disability or impairment. When used as a diagnostic tool the PDS has a sensitivity of .89 and specificity of .75, with 82% agreement with clinical interviews (Foa, Cashman, Jaycox, & Perry, 1997).

Hotspots were measured using a questionnaire based on previous studies (Ayers, 2007; Holmes, et al., 2005). Hotspots were first described as follows: “Some women feel that there are particular parts of the birth that stand out to them and they remember vividly as being especially distressing or negative emotionally. These worst bits are called “hotspots”. Hotspots are sometimes very brief moments and sometimes slightly longer events or situations. Please take a moment to think about whether your *most recent* or *most difficult* experience of birth that you have told us about includes any hotspots’.

Participants were then asked to indicate whether or not they had hotspots. If they did, they were asked to describe each hotspot and indicate if they had ever re-experienced this hotspot. Space was provided for up to 15 hotspots to be described. Finally participants were asked to describe their worst hotspot in more detail. Together, these were used to form the following measures: 1) whether participants reported any hotspots; 2) how many hotspots each woman reported; 3) how many hotspots were re-experienced; and 4) the thematic content of the worst hotspot. Hotspot content was analysed by examining participants’ descriptions of the worst hotspot and coding it according to its most prominent theme, using a

coding schedule developed in a qualitative pilot study of intrapartum hotspots (Harris & Ayers, unpublished).

Cognitions and emotions during hotspots were measured using items from the Initial Reactions subscale of the Potential Stressful Events Interview (Resnick, Falsetti, Kilpatrick, & Freedy, 1996). The scale consisted of 16 emotions and cognitions such as ‘fearful’, ‘sadness’ and ‘panic’ with responses from 0 (not at all) to 3 (extremely). A further 9 items relevant to traumatic birth were added such as ‘that your baby would be seriously injured or killed’, ‘like giving up’ (mental defeat), ‘out of control of what was going on’, ‘that you didn’t understand what was happening’, ‘annoyed or irritated’. Principal components analysis was used to examine the coherence of the 25 items. An oblique (direct oblimin) rotation was used as the factors were correlated. Initial extraction was based on eigenvalues over 1 (Field, 2005). Items were removed if they were detrimental to the reliability (Cronbach’s alpha) of the scale (1 item); loaded highly onto more than one factor ($>.4$; 2 items); or did not load highly onto any factor (3 items). This resulted in a four factor solution consisting of 19 items, which explained 62.7% of the variance in cognitive and emotional content of the hotspots and had good reliability ($\alpha .90$). Final factors were Fear and control (6 items, $\alpha .86$), Anger and conflict (5 items, $\alpha .84$), Intrapartum dissociation (5 items, $\alpha .75$), and Failure and negative affect (3 items, $\alpha .76$). Total scores were calculated as a mean of the 19 items (range 0 – 3). The items, factor structure and loadings are shown in the Appendix.

Statistical analyses were carried out using SPSS 16.0 software. Data screening indicated that hotspot frequency, hotspot cognitions and emotions, and symptoms of re-experiencing, arousal, avoidance and total PTSD symptom scores were skewed therefore non-parametric tests (Kruskal-Wallis, Chi square) were used as appropriate. Backward stepwise logistic regression was used to examine which factors were most predictive of re-experiencing and PTSD.

Results

The majority of participants (57.2%) fulfilled criterion A for a traumatic birth and 18.8% of women had PTSD. This prevalence is higher than usually found in postpartum women due to sampling, which targeted women who had experienced a traumatic or difficult birth (Ayers et al 2009). Four hundred and fifty three women (67.4%) reported at least one hotspot (range 0 – 15, mean = 3.04). Hotspots were re-experienced by 52.9% of participants, with 48.8% reporting that it was the worst hotspot that intruded.

The type of events in women's written descriptions of their worst hotspot are shown in Table 1. The largest category of hotspots concerned interpersonal difficulties, with the most frequent subcategory of being ignored. Obstetric events and pain was the next most frequent category, with more non-painful obstetric hotspots reported than acutely painful events.

The effect of type of event, cognitions and emotions during hotspots on re-experiencing and other PTSD symptoms is shown in Table 2. Women whose hotspots involved interpersonal difficulties reported the highest levels of anger and conflict during the hotspot; and current symptoms of re-experiencing, avoidance, PTSD, distress and impairment. Women whose hotspots involved complications with the baby (neonatal complications) reported the highest levels of failure and negative affect during hotspots.

Stepwise logistic regression was carried out to determine which hotspot characteristics best predicted whether women re-experienced their worst hotspot or had PTSD. Type of event during hotspots was entered on Step 1; and cognitions and emotions during hotspots entered on Step 2. The dependent variable was whether women re-experienced their worst hotspot. Results are shown in Table 3. The model significantly predicted whether women re-experienced their worst hotspot and was a reasonable fit of the data (Hosmer and Lemeshow $\chi^2(8) = 10.62, p = .224$). However, the only significant

predictors that remained in the model were intrapartum dissociation and fear and lack of control during the hotspot.

The same model was run for PTSD (see Table 3). This model was also a reasonable fit of the data (Hosmer and Lemeshow $\chi^2(8) = 12.74, p=.121$) and correctly classified 92.4% of women without PTSD. However, it was less effective at classifying women with PTSD (39.8%). The overall correct classification rate was 78.6%. The final model suggests women were at higher risk of PTSD if their hotspots were about interpersonal difficulties or obstetric complications (compared to complications with the baby) and if they experienced fear and lack of control or intrapartum dissociation during the hotspot. Odds ratios suggest interpersonal difficulties were over four times more likely to lead to PTSD compared to neonatal complications. Similarly, obstetric complications were over three times more likely to lead to PTSD compared to neonatal complications.

Discussion

This study is the first to look at what makes birth traumatic by examining hotspots and provides interesting preliminary findings. First, the results show that about two thirds of women reported intrapartum hotspots and that these involved a range of cognitions and emotions beyond those specified by diagnostic criteria. Second, intrapartum dissociation and fear/lack of control during hotspots were most strongly associated with whether hotspots were re-experienced and whether women reported PTSD. The type of the event experienced was associated with specific cognitions and emotions and PTSD symptoms. Women whose hotspots occurred due to neonatal complications were more likely to report failure and negative affect during the hotspot whereas women who experienced interpersonal difficulties or obstetric complications were more likely to report PTSD.

Cognitions, emotions and dissociation during hotspots

This study illustrated the range of emotions and cognitions women report during birth

hotspots. This suggests hotspots may involve cognitions and emotions beyond those specified by diagnostic criteria, which is consistent with previous research (Holmes, et al., 2005).

Analysis of the cognition and emotion questionnaire aimed to elucidate which cognitions and emotions may be particularly relevant during traumatic birth. This identified other emotions of anger, failure and negative affect (sadness and guilt) in addition to DSM-IV Criterion A responses of fear, helplessness and horror. The other hotspot characteristic consistently predictive of re-experiencing and PTSD was intrapartum dissociation. This is consistent with research in obstetric and other trauma samples suggesting dissociation may be an early marker for the development of PTSD (Olde, et al., 2005; Van der Velden, et al., 2006; Van Son, Verkerk, Van der Hart, Komproe, & Pop, 2005). For example, Olde et al., (2005) found that intrapartum psychoform dissociation and somatoform dissociation were strongly related to PTSD symptoms three months after birth, even after controlling for negative emotions during birth. Dissociation is a broad concept that can describe symptoms, a process, or a pattern of personality organisation (Vermetten, Dorahy, & Spiegel, 2007). However, the items in the intrapartum dissociation subscale used here measured states that could indicate non-dissociative alterations of consciousness (feeling as if in a dream, that it wasn't really happening and altered time perception); as well as items that measured a breakdown in processing (confusion) and emotional numbing. It is therefore important that future research examines the relationship between dissociation during birth and PTSD using more comprehensive measures of dissociation.

Type of event during hotspots

Another important finding was that type of events experienced during birth was associated with specific cognitions, emotions and PTSD symptoms. This provides insight into the type of events during birth that may be traumatising – in particular that interpersonal difficulties and obstetric complications are more likely to lead to PTSD than neonatal complications.

This may be for a variety of reasons, including that difficulties experienced personally may be a more potent trigger of PTSD than those that occur to a significant other. In addition, women whose babies have complications may be more supported by hospital staff or friends and family because having an ill baby is more socially acknowledged to be stressful. However, this needs further exploration.

In this sample, interpersonal difficulties during birth were the strongest predictor of PTSD, with over four times increased risk, as well as being associated with anger and conflict. It is interesting that the interpersonal events described in both studies were mostly concerned with lack of support (e.g. being ignored, feeling unsupported or abandoned). The importance of support during stressful events is well established. There is also substantial literature showing that support during labour results in better psychological and physical outcomes (Hodnett, Gates, Hofmeyr, & Sakala, 2007). Very few studies have examined the effect of lack of support during labour on PTSD but those studies that have been done confirm its importance. For example, an experimental analogue study found that manipulating levels of support in birth stories resulted in corresponding shifts in anxiety and mood in women (Ford & Ayers, 2009). Similarly, a prospective study found that lack of support during birth interacted with a woman's trauma history and type of delivery to predict PTSD symptoms three months later (Ford & Ayers, 2011). Similarly, trauma research in non-obstetric samples provides evidence that interpersonal traumatising events are more likely to result in PTSD than noninterpersonal events (Kessler, McGonagle, Zhao, Nelson, & Hughes, 1994; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and that lack of support has a substantial effect on PTSD symptoms (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). This has led to increasing emphasis on the social ecology of traumatising events as important determinants of PTSD (Charuvastra & Cloitre, 2008). Thus, although the current study did not directly examine support during birth, the finding that

interpersonal events are associated with negative emotions and PTSD symptoms is consistent with research from both childbirth and PTSD literature that suggests lack of support is important in the development of PTSD symptoms.

Limitations

These findings need to be considered in light of a few methodological limitations. The cross-sectional design means the causality cannot be inferred. Therefore it is plausible that the existence of PTSD symptoms causes hotspots to be reported and not vice versa. However, the lack of any relationship between trauma history and hotspots makes this explanation unlikely. Retrospective reporting of hotspots and the long time since birth means that reports of events, emotions and cognitions may not be accurate. The possibility of inaccurate or biased recall is an issue in most trauma research which is by nature retrospective because traumatising events are rarely predictable.

Recruiting women via the internet means the sample is not representative of all postpartum women. This sampling method was used because the prevalence of traumatic birth is low; therefore internet sampling enabled access to a large number of women who had experienced traumatic birth. To access a similar sample in the community would require significant resources. However, the limitations of internet sampling (Ayers et al., 2009) and the fact that participants were predominantly white European means results cannot be generalised. In addition, participants were a self-selected group of women who have access to the internet. However, as the first study to examine hotspots for traumatic birth, and to examine hotspots in a large nonclinical sample, results can be taken as suggestive of the relationship between peritraumatic events, cognitions and emotions, and PTSD. This can then be further explored or replicated in large-scale research with community samples.

Conclusions

Taking into consideration methodological limitations, a number of conclusions can be drawn. This study shows that many women report hotspots from traumatic birth and provides insight into the nature of these hotspots and associated re-experiencing symptoms of PTSD. Emotions and cognitions experienced during hotspots appear to be influenced by the type of event that occurred. Interpersonal difficulties and obstetric complications are associated with a higher risk of PTSD than complications with the baby. Interpersonal difficulties during birth are associated with anger, PTSD symptoms and distress. However, the direction of causality is difficult to discern from the current study. Longitudinal research is therefore needed to examine this further. These findings support the role of hotspots in PTSD and suggest that identifying hotspots and exploring cognitions and emotions during hotspots may be useful when trying to prevent or treat symptoms of PTSD. In particular, identifying hotspots that involve fear or intrapartum dissociation may be useful when treating associated intrusions. If replicated, these results have a number of implications for intrapartum care – primarily that providing reassurance, support, and identifying and dealing with interpersonal difficulties may prevent a birth being experienced as traumatic.

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References

- Alcorn, K. L., O'Donovan, A., Patrick, J. C., Creedy, D., & Devilly, G. J. (2010). A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. *Psychological Medicine, 40*, 1849-1859.
- Allen, S. (1998). A qualitative analysis of the process, mediating variables and impact of traumatic childbirth. *Journal of Reproductive and Infant Psychology, 16*, 107-131.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (Fourth edition - Text Revision ed.): American Psychiatric Association.
- Ayers, S. (2004). Delivery as a traumatic event: Prevalence, risk factors and treatment for postnatal posttraumatic stress disorder. *Clinical Obstetrics and Gynecology, 47*(3), 552-567.
- Ayers, S. (2007). Thoughts and emotions during traumatic birth: A qualitative study. *Birth, 34*(3), 253-263.
- Ayers, S., Eagle, A., & Waring, H. (2006). The effects of childbirth-related post-traumatic stress disorder on women and their relationships: A qualitative study. *Psychology, Health and Medicine, 11*(4), 389-398.
- Ayers, S., Harris, R., Sawyer, A., Parfitt, Y., & Ford, E. (2009). Posttraumatic stress disorder after childbirth: Analysis of symptom presentation and sampling. *Journal of Affective Disorders, 119*, 200-204.
- Ayers, S., Joseph, S., McKenzie-McHarg, K., Slade, P., & Wijma, K. (2008). Post-traumatic stress disorder following childbirth: Current issues and recommendations for future research. *Journal of Psychosomatic Obstetrics and Gynaecology, 29*(4), 240-250.
- Ayers, S., & Pickering, A. (2001). Do women get posttraumatic stress disorder as a result of childbirth? A prospective study of incidence. *Birth, 2*, 111-118.
- Beck, C. T. (2004a). Birth trauma: In the eye of the beholder. *Nursing Research, 53*, 28-35.
- Beck, C. T. (2004b). Post-traumatic stress disorder due to childbirth: The aftermath. *Nursing Research, 53*, 216-224.
- Beck, T. C. (2006). The anniversary of birth trauma: Failure to rescue. *Nursing Research, 55*(6), 381-390.
- Beck, T. C., & Watson, S. (2008). Impact of birth trauma on breastfeeding: A tale of two pathways. *Nursing Research, 57*(4), 228-236.
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-Analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748-766.
- Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annual Review of Psychology, 59*, 301-328.
- Creedy, D., Shochet, I., & Horsfall, J. (2000). Childbirth and the development of acute trauma symptoms. *Birth, 27*(2), 104-111.
- Czarnocka, J., & Slade, P. (2000). Prevalence and predictors of post-traumatic stress symptoms following childbirth. *British Journal of Clinical Psychology, 39*, 35-51.
- Elmir, R., Schmied, V., Wilkes, L., & Jackson, D. (2010). Women's perceptions and experiences of a traumatic birth: A meta-ethnography. *Journal of Advanced Nursing, 66*(10), 2142-2153.
- Field, A. (2005). *Discovering Statistics using SPSS* (2nd Edition ed.). London: Sage Publications.
- Foa, E. B. (1995). *The Posttraumatic Diagnostic Scale (PDS)*. Minneapolis, MN: National Computer Systems.
- Ford, E., & Ayers, S. (2009). Stressful events and support during birth: The effect on anxiety, mood, and perceived control. *Journal of Anxiety Disorders, 23*, 260-268.

- Ford, E., & Ayers, S. (2011). Support during birth interacts with trauma history and birth intervention to predict postnatal post-traumatic stress symptoms. *Psychology and Health*. DOI: 10.1080/08870446.2010.533770.
- Grey, N., Holmes, E., Brewin, C.R. (2001). Peritraumatic emotional "hotspots" in memory. *Behavioural and Cognitive Psychotherapy*, 29(3), 367-372.
- Grey, N., & Holmes, E. A. (2008). "Hotspots" in trauma memories in the treatment of post-traumatic stress disorder: A replication. *Memory*, 16(7), 788-796.
- Grey, N., Young, K. A. D., & Holmes, E. A. (2002). Cognitive restructuring within reliving: A treatment for peritraumatic emotional "hotspots" in posttraumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 36(1), 3-17.
- Hodnett, E. D., Gates, S., Hofmeyr, G., & Sakala, C. (2007). Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews*(3).
- Holmes, E. A., Grey, N., & Young, K. A. D. (2005). Intrusive images and "hotspots" of trauma memories in posttraumatic stress disorder: An exploratory investigation of emotions and cognitive themes. *Journal of Behavior Therapy and Experimental Psychiatry*, 36, 3-17.
- Jelinek, L., Stockbauer, C., Randjbar, S., Kellner, M., Ehring, T., & Moritz, S. (2010). Characteristics and organization of the worst moment of trauma memories in posttraumatic stress disorder. *Behavior Research and Therapy*, 48, 680-685.
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., & Hughes, M. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives General Psychiatry*, 51(1), 8-19.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the national comorbidity survey. *Archives General Psychiatry*, 52, 1048-1060.
- Moyzakis, W. (2004). Exploring women's descriptions of distress and/or trauma in childbirth from a feminist perspective. *Evidence Based Midwifer*, 2, 8-14.
- Nicholls, K., & Ayers, S. (2007). Childbirth-related post traumatic stress disorder in couples: A qualitative study. *British Journal of Health Psychology*, 21(4), 491-509.
- Olde, E., Van der Hart, O., Kleber, R., & Van Son, M. J. M. (2006). Posttraumatic stress following childbirth: A review. *Clinical Psychology Review*, 26, 1-16.
- Olde, E., Van der Hart, O., Kleber, R., Van Son, M. J. M., Wijnen, H., & Pop, V. J. M. (2005). Peritraumatic dissociation and emotions as predictors of PTSD symptoms following childbirth. *Journal of Trauma and Dissociation*, 6(3), 125-142.
- Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, 129(1), 52-73.
- Resnick, H. S., Falsetti, S. A., Kilpatrick, D. G., & Freedy, J. R. (1996). Assessment of rape and other civilian trauma-related post-traumatic stress disorder: Emphasis on assessment of potentially traumatic events. In T. W. Miller (Ed.), *Stressful life events* (pp. 231-266). Madison: International Universities Press.
- Skari, H., Skreden, M., Malt, U., Dalholt, M., Ostensen, A., Egeland, T., et al. (2002). Comparative levels of psychological distress, stress symptoms, depression and anxiety after childbirth - a prospective population based study of mothers and fathers. *British Journal of Obstetrics and Gynaecology*, 109, 1154-1163.
- Soderquist, J., Wijma, K., & Wijma, B. (2002). Traumatic stress after childbirth: The role of obstetric variables. *Journal of Psychosomatic Obstetrics and Gynecology*, 23, 31-39.
- Soet, J., Brack, G., & Dilorio, C. (2003). Prevalence and predictors of women's experience of psychological trauma during childbirth. *Birth*, 30, 36-46.

- Tedstone, J. E., & Tarrier, N. (2003). Posttraumatic stress disorder following medical illness and treatment. *Clinical Psychology Review, 23*(3), 409-448.
- Thompson, J., & Downe, S. (2008). Widening the trauma discourse: The link between childbirth and experiences of abuse. *Journal of Psychosomatic Obstetrics and Gynecology, 29*(4), 268-273.
- Van der Hart, O., Nijenhuis, E.R.S., & Steele, K. (2006). *The haunted self: Structural dissociation and the treatment of chronic traumatization*. New York/London: Norton.
- Van der Velden, P. G., Kleber, R., Christiaanse, B., Gersons, B. P., Marcelis, F. G. H., Drogendijk, A. N., et al. (2006). The independent predictive value of peritraumatic dissociation for postdisaster intrusions, avoidance reactions, and PTSD symptom severity: A 4-year prospective study. *Journal of Traumatic Stress, 19*(4), 493-506.
- Van Son, M. J. M., Verkerk, G. J. M., Van der Hart, O., Komproe, I., & Pop, V. J. M. (2005). Prenatal depression, mode of delivery and perinatal dissociation as predictors of postpartum posttraumatic stress: An empirical study. *Clinical Psychology and Psychotherapy, 12*, 297-312.
- Vermetten, E., Dorahy, M.J., & Spiegel, D. (2007). *Traumatic Dissociation: Neurobiology and Treatment*. London: American Psychiatric Publishing Inc.
- Wijma, K., Soderquist, J., & Wijma, B. (1997). Posttraumatic stress disorder after childbirth: A cross sectional study. *Journal of Anxiety Disorders, 11*(6), 587-597.

Table 1. *Thematic content of worst hotspot (n = 453)*

Theme	N (%)
Interpersonal	166 (36.6)
Being ignored	50 (11.0)
Lack of support	47 (10.4)
Poor communication	44 (9.7)
Being abandoned	21 (4.6)
Being put under pressure	4 (0.9)
Events concerning the baby	124 (27.4)
Problems with the baby	104 (23.0)
Separation from the baby	20 (4.4)
Obstetric events and pain	163 (36.0)
Obstetric events	98 (21.6)
Pain	65 (14.4)

Table 2. *The effect of thematic content on cognitions and emotions during hotspots and PTSD symptoms (N = 453)^a*

	Interpersonal issues N = 166 Mean (SD)	Neonatal complications N = 124 Mean (SD)	Obstetric events N = 163 Mean (SD)	Kruskal Wallis or Chi square p
Total number of hotspots reported	4.86 (3.27)	4.57 (3.12)	4.16 (2.80)	.064
Number of hotspots re-experienced	3.51 (3.49)	3.10 (2.87)	2.72 (2.99)	.072
Hotspot cognitions and emotions total	35.04 (12.56)	32.83 (12.59)	31.34 (13.77)	.032
Fear and control	14.41 (4.49)	13.83 (4.51)	14.15 (4.64)	.335
Anger and conflict	8.02 (4.70)	4.58 (4.56)	5.44 (4.83)	.000
Intrapartum dissociation	8.25 (4.41)	9.19 (4.37)	7.95 (4.50)	.053
Failure and negative affect	4.36 (3.20)	5.21 (3.15)	3.81 (3.16)	.002
PTSD symptoms total	19.39 (12.94)	15.01 (11.40)	18.36 (13.29)	.017
Re-experiencing	6.24 (4.29)	4.90 (4.04)	5.46 (4.24)	.015
Avoidance	7.56 (5.83)	5.26 (4.94)	7.37 (5.96)	.004
Arousal	5.59 (4.46)	4.84 (4.14)	5.53 (4.50)	.333
Criterion A <i>n</i> (%) ^b	115 (36.4%)	90 (28.5%)	111 (35.1%)	.490
Significant impairment <i>n</i> (%) ^b	92 (42.6%)	42 (19.4%)	82 (38.0%)	.001
Significant distress <i>n</i> (%) ^b	139 (38.3%)	99 (27.2%)	126 (34.6%)	.011
PTSD cases <i>n</i> (%) ^b	55 (47%)	17 (14.5%)	45 (38.5%)	.001

^a missing data means *n* ranges from 329 - 453. ^b Percentages show the proportion of women who fulfilled DSM criteria.

Table 3. *Stepwise logistic regression of hotspot characteristics on re-experiencing and risk of PTSD (n=412)*

Dependent variable	Variables in the model	B	OR (95% CI)	Overall model statistics ^a
Re-experiencing of worst hotspot	Fear and control	.07 [*]	1.07 (1.01, 1.13)	$\chi^2 (2) = 26.30^{***}$ R^2 0.10
	Intrapartum dissociation	.10 ^{**}	1.10 (1.04, 1.17)	
PTSD cases	Interpersonal difficulties ^b	1.47 ^{***}	4.34 (2.15, 8.77)	$\chi^2 (4) = 94.50^{***}$ R^2 0.30
	Obstetric events ^b	1.21 ^{***}	3.35 (1.64, 6.87)	
	Fear and control	.26 ^{***}	1.30 (1.17, 1.43)	
	Intrapartum dissociation	.11 ^{***}	1.12 (1.05, 1.19)	

^a Nagelkerke R^2 reported. ^b Contrasts with neonatal complications as the reference category. * $p < .05$, ** $p < .005$, *** $p < .001$.

Appendix. Hotspot emotions and cognitions scale

At the time of the most distressing hotspot during the birth, did you feel:

	Factor 1	Factor 2	Factor 3	Factor 4
Fear and lack of control				
Distressed	.86			
Panicked	.85			
Fearful or scared	.79			
Out of control of what was going on	.77			
Helpless	.71			
Horrorified	.69			
Anger and conflict				
Annoyed or irritated		.85		
Disgusted		.85		
Angry		.84		
That your trust had been violated		.73		
You were going crazy or would lose control of your emotions or behaviour		.61		
Intrapartum dissociation				
Detached as if in a dream			.86	
It wasn't really happening			.72	
Emotionally numb			.70	
That time sped up or slowed down			.68	
Confused or disorientated			.67	
Failure and negative affect				
Guilty				-.80
Like you had failed				-.79
Sad				-.70
Eigenvalues	6.86	2.21	1.77	1.07
Variance	36.09	11.65	9.33	5.61