



Posttraumatic stress following childbirth: A review

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Abstract

To assess the empirical basis of prevalence and risk factors of childbirth-related posttraumatic stress symptoms and PTSD in mothers, the relevant literature was critically reviewed. A MEDLINE and PSYCHLIT search using the key words “posttraumatic stress”, “PTSD”, “childbirth” and “traumatic delivery” was performed. The generated list of articles was supplemented by a review of their bibliographies. A total of 31 articles was selected. The primary inclusion criterion was report of posttraumatic stress symptoms or PTSD specifically related to childbirth. Case studies and quantitative studies on regular childbirth and childbirth by emergency cesarean section were identified. Consistency among studies was found with regard to development of posttraumatic stress symptoms as a consequence of traumatic delivery. Methodological issues concerning prevalence and risk factors were discussed. Case studies and quantitative studies confirm that childbirth may be experienced as so emotionally intense that it can lead to the development of posttraumatic stress symptoms or even a PTSD-profile. Among the identified risk factors were a history of psychological problems, trait anxiety, obstetric procedures, negative aspects in staff–mother contact, feelings of loss of control over the situation, and lack of partner support. The conclusion of the current review is twofold. First, traumatic reactions to childbirth are an important public health issue. Secondly, studying childbirth offers opportunity to prospectively study the development of posttraumatic stress reactions.

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Childbirth is a complex event that may lead to a variety of psychological responses, both positive and negative. It may even lead to mental disorders, in particular postpartum depression (PPD) and postpartum psychosis (Brockington, 1996). Recently, several studies have focused on posttraumatic stress disorder (PTSD) associated with childbirth (Ayers & Pickering, 2001; Creedy, Shochet, & Horsfall, 2000; Czarnocka & Slade, 2000; Wijma, Soderquist, & Wijma, 1997). Symptoms of PTSD are categorized into three symptom clusters in the Diagnostic and Statistical Manual for Mental Disorders, fourth edition (DSM-IV) (APA, 1994): reexperiencing (e.g. nightmares about the delivery, flashbacks of the event), persistent avoidance (e.g., avoiding getting pregnant again, amnesia for the event) and increased arousal (e.g., irritability, concentration problems).

PTSD was formally listed in DSM-III in 1980 as an anxiety disorder encompassing symptoms subsequent to exposure to “extreme events that were outside the range of usual human experience” (APA, 1980). These extreme events included combat, rape, disaster, robbery and witnessing someone getting killed or severely wounded. According to this definition, childbirth would not be classified as a potentially traumatic stressor, because it is within the range of usual experience for approximately half of the population. In DSM-IV (APA, 1994) the stressor criterion has been adjusted to “stressful situations in which a person had experienced, witnessed, or was confronted with an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others”. It also included the subjective response to such events, i.e., feelings of intense fear, helplessness or horror. This definition may well apply to what some women may experience when giving birth to a child.

With regard to childbirth, PTSD has been associated with partus-related experiences such as stillbirth, pregnancy loss, premature birth and perinatal loss. For instance, a study on the psychological consequences of stillbirth reported that 29% of the women consequently developed PTSD at one point in

their lives (Turton, Hughes, Evans, & Fainman, 2001). Among women who experienced pregnancy loss (Engelhard, Van den Hout, & Arntz, 2001), a prevalence rate of 25% of PTSD was found at one month and a rate of 7% at four months after the loss. Between 26% and 41% of the mothers who experienced a premature birth reported posttraumatic stress symptoms (Pierrehumbert, Nicole, Muller-Nix, Forcada-Guex, & Ansermet, 2003). Another study on premature childbirth indicated that posttraumatic stress symptoms were common 6 months postpartum (Holditch-Davis, Bartlett, Blickman, & Miles, 2003). A study that assessed posttraumatic stress reactions after perinatal death reported that a quarter of the women suffered from intrusive images of the delivery (Hunfeld, Wladimiroff, & Passchier, 1997).

All the above mentioned studies concerned irregular childbirth, but early studies have pointed out that even regular childbirth (i.e. full-term pregnancy with healthy outcome) may lead to the development of posttraumatic stress symptoms, even to a level of full-blown PTSD (Ballard, Stanley, & Brockington, 1995; Fones, 1996; Moleman, Van der Hart, & Van der Kolk, 1992). Women were found to develop intrusive symptoms such as flashbacks and nightmares. Symptoms of avoidance that were found were avoiding talking or reading about birth or pregnancy related issues. Symptoms of increased arousal were sweating, trembling, being irritated and sleep disturbances (Ballard et al., 1995; Bydlowski & Raoul-Duval, 1978; Church & Scanlan, 2002; Fones, 1996; Moleman et al., 1992). Since these case studies, several quantitative studies on posttraumatic stress symptoms after regular childbirth have been published.

The aim of this article is to review the literature on prevalence rates and risk factors of postpartum PTSD and its symptoms in mothers after successful childbirth. We do not focus on studies on posttraumatic stress related to abortion, stillbirth, or perinatal death. This review includes both case studies and empirical studies on clinical, etiological, and epidemiological aspects relevant to childbirth-related posttraumatic stress symptoms and PTSD. Methodological issues regarding the findings on prevalence rates and risk factors will be critically discussed.

1. Methods

Search in MEDLINE and PSYCHLIT databases of English language abstracts from January 1977 to November 2003 was performed. Keywords “PTSD”, “childbirth”, “traumatic delivery” and “posttraumatic stress” were used, both individually and in combination. Subsequently, references in articles detected in the MEDLINE and PSYCHLIT search were added. Studies on PTSD as well as posttraumatic stress symptoms after childbirth were included, all in English, except for one in French (this study was found in references of other articles (Ballard et al., 1995; Reynolds, 1997)). Studies were included on the following grounds: (a) the studies focused on mothers that experienced successful childbirth, including normal deliveries and deliveries by cesarean section; b) as a dependent variable posttraumatic stress symptoms were assessed; (c) prevalence rates of PTSD were reported and (d) risk factors of posttraumatic stress symptoms or PTSD related to childbirth were reported.

2. Results

A total of 34 studies was identified. Nine studies were excluded because they reported posttraumatic stress symptoms in relation to gynecological or obstetric aspects other than regular childbirth, such as

spontaneous abortion, pregnancy loss, stillbirth, obstetric and/or gynecological procedures (not related to childbirth), tokophobia and pregnancy complications (Bowles et al., 2000; Engelhard et al., 2001; Hofberg & Brockington, 2000; Holditch-Davis et al., 2003; Hunfeld et al., 1997; Menage, 1993; Pierrehumbert et al., 2003; Seng et al., 2001; Turton et al., 2001). One study was excluded because it focused specifically on parents of infants with a high-risk birth (DeMier, Hynan, Harris, & Manniello, 1996) and another because it focused on stressful life events related to childbearing (Arizmendi & Affonso, 1987). Two articles were not included because they did not report original research data but described the phenomenon of traumatic childbirth (Charles, 1997; Reynolds, 1997). Finally, one article was excluded because it was a Letter to the Editor stressing the fact that childbirth could be a traumatic experience and that patient doctor communication was an important aspect in this matter (Beech & Robinson, 1985).

With regard to the remaining 19 articles relevant for this study, three groups could be distinguished: 1) five case studies (Ballard et al., 1995; Bydlowski & Raoul-Duval, 1978; Church & Scanlan, 2002; Fones, 1996; Moleman et al., 1992); 2) 10 quantitative studies (Allen, 1998; Ayers & Pickering, 2001; Creedy et al., 2000; Czarnocka & Slade, 2000; Keogh, Ayers, & Francis, 2002; Lyons, 1998; Skari et al., 2002; Soderquist, Wijma, & Wijma, 2002; Soet, Brack, & DiIorio, 2003; Wijma et al., 1997); and 3) four studies on emergency cesarean section (Ryding, Wijma, & Wijma, 1997; Ryding, Wijma, & Wijma, 1998a; Ryding, Wijma, & Wijma, 1998b; Ryding, Wijma, & Wijma, 2000). One study used both qualitative and quantitative analyses (for the current article we used the qualitative results, as the quantitative results did not indicate clear data about prevalence or risk factors).

2.1. Case studies

The case studies were the first descriptions of the phenomenon of childbirth-related PTSD. Results are suggestive of specific disturbances as well as the etiological factors that might be important.

The five case studies all reported presence of PTSD symptoms (see Table 1). Intrusive symptoms such as flashbacks and nightmares were reported as well as symptoms of avoidance (amnesia for the whole or parts of the event), problems in developing a positive mother–child attachment, not having sex in order to prevent another pregnancy to occur, avoidance of birth and pregnancy related issues. Reported symptoms of increased arousal involved sweating, trembling, being irritated, and sleep disturbances (Ballard et al., 1995; Bydlowski & Raoul-Duval, 1978; Church & Scanlan, 2002; Fones, 1996; Moleman et al., 1992).

One study qualitatively studied 20 women who perceived their delivery as traumatic (Allen, 1998). All participants stated that during their labour they had experienced intense feelings of not being in control. The belief that the baby would be harmed, pain and ineffective pain relief, previous traumatic experiences, unsupportive staff and expectations towards childbirth that were not met were factors that were supposed to have contributed to feelings of lack of control.

Antenatal as well as perinatal causes for developing posttraumatic stress symptoms were identified. Common aspects detected in the case studies were: 1) fear of losing or harming oneself or the baby; 2) a lack of control; 3) characteristics of delivery, such as long duration, complications, emergency cesarean section, insufficient pain relief and vacuum extraction; 4) lack of information or support by the staff; and 5) previous traumatic (delivery) experiences. Also dissociative phenomena were considered to be related

Table 1
Case studies on PTSD symptoms related to childbirth

Study (year)	<i>N</i>	PTSD symptoms	Possible contributing factors
Moleman et al. (1992)	3	PTSD symptoms; e.g.: nightmares, intrusive recollections, emotional detachment from baby, emotional numbing, dissociation, irritability	Fear of losing baby, panic, history of infertility, peritraumatic dissociation
Ballard et al. (1995)	4	PTSD symptom profile; e.g.: nightmares, intrusive recollections, avoiding contact with baby, avoiding reading/talking about childbirth, sweating, trembling, anxious and angry	Complicated deliveries, poor pain control, risk of harming baby, lack of control
Fones (1996)	1	PTSD; e.g.: intrusions, anxiety or panic symptoms, avoiding reading/talking about childbirth, avoiding having sex, extreme worries about getting pregnant, headaches	Prolonged and difficult labour, forceps delivery
Bydlowski and Raoul-Duval (1978)	10	Postpartum traumatic neurosis; e.g.: nightmares, intrusive recollections, avoiding pregnancy, sleep disturbances	Long and complicated previous labours, forceps delivery, pain, fear for harming baby
Church and Scanlan (2002)	1	Acute stress reactions, amnesia, nightmares, flashbacks,	Loss of control, panic, fear, lack of information by staff, vacuum extraction

to the development of posttraumatic stress symptoms (Moleman et al., 1992). Given the fact that one cannot generalize from this type of research, the findings in these studies on symptoms and determinants of posttraumatic stress symptoms may be regarded as heuristic and need to be supported by quantitative analyses.

2.2. Quantitative studies

The listed quantitative studies (Table 2) confirmed that women may develop PTSD or posttraumatic stress symptoms after childbirth (Ayers & Pickering, 2001; Creedy et al., 2000; Czarnocka & Slade, 2000; Lyons, 1998; Skari et al., 2002; Soderquist et al., 2002; Wijma et al., 1997). Instead of PTSD, we prefer to use the term PTSD-profile when the symptom criteria of the DSM-IV (B, C and D) (APA, 1994) were met, because not all other criteria (A, E and F) were assessed in most studies.

2.3. Prevalence

Six studies investigated prevalence of a PTSD-profile and reported prevalences of 2.8–5.6% at approximately 6 weeks postpartum (see Table 2). Prevalence of a PTSD-profile decreased to a level of around 1.5% at six months postpartum according to the studies of Ayers and Pickering (2001) and Wijma et al. (1997). The 0.8% prevalence rate of Skari et al. (2002) is difficult to interpret because these authors did not use an instrument that investigated the symptoms of PTSD according to DSM-IV. Therefore, we consider results of Ayers and Pickering (2001) and Wijma et al. (1997), who did use instruments that followed DSM-IV criteria as more reliable.

Table 2
Instruments and prevalence rates of the quantitative studies

Author	N	Measure	Traumatic experience	PTSD symptoms	PTSD-profile
Wijma et al. (1997)	1640	TES			1.7% (1–13 months ppm)
Czarnocka and Slade (2000)	264	IES, PTSD-Q		24%	3% at 6 weeks ppm
Ayers and Pickering (2001)	289	PSS			2.8% 6 weeks ppm; 1.5% 6 months ppm
Creedy et al. (2000)	499	PSS	33%	33%	5.6% 4–6 weeks ppm
Allen (1998)	20	IES	13.7%	6 women <42; 8–10 months ppm	
Lyons (1998)	42	IES		3 women in medium range (28–41), 1 women high range (56)	
Skari et al. (2002)	127	IES		<3% at 6 months ppm	0.8% 6 months ppm
Soet et al. (2003)	103	TES	34%	30.1%	1.9% 8 weeks ppm

TES: Traumatic Experiences Scale; IES: Impact of Event Scale; PTSD-Q: Posttraumatic Stress Disorder-Questionnaire; PSS: PTSD Symptom Scale; ppm: postpartum.

From the general trauma literature it is known that only a minority of people develops PTSD after having experienced a shocking event. A larger number of individuals, however, may develop posttraumatic stress symptoms, which may be part of a normal response to highly stressful events (Kleber & Brom, 1992). Czarnocka and Slade (2000) concluded that 24% of the women in their study suffered from various specific posttraumatic stress symptoms at six weeks postpartum, where Soet et al. (2003) found that 30.1% of their sample was partially symptomatic. Creedy et al. (2000) reported that 33% of the women reported a stressful birthing experience and three or more traumatic stress symptoms. Soet et al. (2003) as well as Creedy et al. (2000) investigated whether women experienced the delivery itself as traumatic; they reported rates of 34% and 33% respectively.

2.4. Risk factors

A variety of risk factors have been detected. One quantitative study investigated risk factors for a PTSD-profile (Wijma et al., 1997), whereas five quantitative studies investigated risk factors for developing posttraumatic stress symptoms (Creedy et al., 2000; Czarnocka & Slade, 2000; Lyons, 1998; Skari et al., 2002; Soet et al., 2003).

Wijma et al. (1997) reported that a history of psychiatric/psychological counseling, nulliparity (women not having given birth before in contrast to women who already gave birth to one or more children, labeled as multiparity), a negative cognitive appraisal of the delivery and rating the contact with staff in negative terms were associated with a PTSD-profile. A history of psychological problems, trait anxiety, episiotomy, feelings of loss of control, perception of low levels of support from partner and staff, and blaming the staff for difficulties during labor were found to be related to the development of posttraumatic stress symptoms (Wijma et al., 1997). One study (Creedy et al., 2000) found level of obstetric interventions, perception of inadequate intrapartum care, and lack of support by the partner (or support person) to be related with posttraumatic stress symptoms. Lyons (1998) reported that a difficult pregnancy, higher neuroticism scores, having an epidural, or being induced, negative emotions associated with pain, feelings of not being in control during delivery, and lack of information were

associated with posttraumatic stress symptoms. Lyons' findings should be interpreted with caution, because a small sample was used (42 women) and only correlations and *t*-tests were reported, so no conclusions can be drawn about the relative strength of these risk factors. Soet et al. (2003) found support for perinatal pain, lack of social support, internal locus of control, trait anxiety and lower coping skills in relation to labor to be associated with being partially to fully symptomatic. The study by Skari et al. (2002) is somewhat difficult to interpret, because these authors examined associations between risk factors and levels of psychological distress, a construct somewhat different from posttraumatic stress. Being a single parent, multiparity, and a previous traumatic birth experience were associated with acute maternal psychological distress.

Two studies focused on the role of specific risk factors. Soderquist et al. (2002) looked at the role of obstetric variables, whereas Keogh et al. (2002) examined the role of anxiety sensitivity. The risk of having a PTSD-profile was found to be higher in women who delivered by instrumental vaginal delivery (IVD) or emergency cesarean section (EmCs), compared to women who had an elective cesarean section (EICs) or a normal vaginal delivery (NVD). However, Soderquist et al. (2002) pointed out that in their study most women with a PTSD-profile were found in the NVD group. Thus, they concluded that when the experience objectively becomes less dangerous, the more important the role of personal pretrauma characteristics will be.

In a pilot study (Keogh et al., 2002) the role of anxiety sensitivity (AS) was prospectively studied in a group of 40 women. AS was found to be related to the development of posttraumatic stress symptoms. Also EICs was found to be related with higher risk of posttraumatic stress symptoms. Women who had an EICs had higher AS scores compared to women who had a NVD or an EmCs. In this study, however, posttraumatic stress symptoms were measured only two weeks postpartum. Although early stress symptoms may predict later development of PTSD, the positive predictive power of acute stress symptoms is not optimal for identifying people who develop long-term PTSD (Harvey & Bryant, 2002). Experiencing high levels of distress in the acute phase may be a normal response and therefore it is unclear what the data of the study of Keogh et al. (2002) imply for PTSD at the long term.

2.5. *Studies on cesarean section*

Several studies conducted by Ryding et al. (1997, 1998a, 1998b, 2000) focused on the impact of EmCs. Women who underwent EmCs reported the most negative cognitions and emotions regarding delivery overall. Women who underwent EmCs or IVD reported more symptoms of posttraumatic stress compared to women who had an EICs or a NVD (Ryding et al., 1998b). In a study of 25 women, 19 had experienced the EmCs as traumatic, 13 of these 19 women experienced posttraumatic stress symptoms, of which 8 experienced serious intrusive stress reactions one to two months later (Ryding et al., 1997, 1998a). Feeling wrongly treated by the staff, previous negative experiences as a patient, and a poor relationship with the partner were identified as predisposing psychological factors for these intrusive stress reactions (Ryding et al., 1998a, 2000). In a second report of this study women's expectations towards the delivery were assessed. Women whose positive expectations turned into disappointment and women whose fears came true, all experienced the EmCs as traumatic and had the largest chance to develop posttraumatic intrusive stress reactions (Ryding et al., 2000). A limitation of these studies (Ryding et al., 1997, 1998a, 2000) is the small number of subjects (25), so that generalization of results is problematic.

3. Methodological issues regarding prevalence

Prevalence concerning a PTSD-profile and posttraumatic stress symptoms in women following delivery as well as results in risk factors differed remarkably between the quantitative studies. These inconsistent data raise doubt about the actual prevalence and also about possible risk factors. They may be related to various methodological shortcomings, in particular, variations in: 1) time of measurement; 2) instrument use; and/or 3) sample characteristics.

3.1. Time of measurement

As for time of measurement, prevalence rates of PTSD-profiles were usually higher when assessed early after delivery. The highest prevalence of 5.6% was found in a study assessing women in the period 4 to 6 weeks after delivery (Creedy et al., 2000). This study used the earliest time point to measure a PTSD-profile.

Natural recovery of acute stress symptoms could cause differences in reports of disturbances. Two studies investigated prevalence of a PTSD-profile over a longer period of time (Ayers & Pickering, 2001; Wijma et al., 1997), indicating prevalence decreased over time. Ayers and Pickering (2001) found a prevalence of 2.8% at six weeks and 1.5% at six months postpartum. Cross-sectional results of Wijma et al. (1997) indicated a higher prevalence rate of a PTSD-profile of 1.9% 1 to 6 months postpartum, compared to 1.6% 6 to 13 months postpartum. As these results were cross-sectional, it cannot be concluded that the prevalence rate of childbirth-related PTSD decreased over time. Nevertheless, results show that a small proportion of women will suffer from chronic childbirth-related PTSD.

The assumption of natural recovery appears to be supported by longitudinal data which show a decrease in PTSD-profile between 6 weeks and 6 months (Ayers & Pickering, 2001). The data imply that a substantial part of newly delivered women may suffer from posttraumatic stress symptoms in the first months following childbirth even to a level of a PTSD-profile. Prevalence of PTSD tends to decrease over the course of time to approximately 1.5% 6 months postpartum. No longitudinal data are available regarding PTSD-profile prevalence rates longer than 6 months postpartum.

3.2. Instruments

Various self-report instruments were used to assess PTSD-profiles, of which several did not assess all criteria of PTSD. Based on the findings of the studies discussed in this review, it remains, therefore, uncertain whether women with this PTSD-profile indeed suffered from clinical PTSD.

Only two quantitative studies investigated all six DSM-IV diagnostic criteria (A–F) for PTSD (Soderquist et al., 2002; Wijma et al., 1997) using the Traumatic Experiences Scale (TES). Three studies did not assess the A-criterion (Ayers & Pickering, 2001; Czarnocka & Slade, 2000; Skari et al., 2002), which makes it difficult to interpret whether the reported posttraumatic stress symptoms were related to a traumatic childbirth experience. PTSD could already have been present before childbirth.

The PTSD Symptom Scale (PSS) (Foa, Riggs, Dancu, & Rothbaum, 1993) was used (Ayers & Pickering, 2001; Creedy et al., 2000) which does not assess the A-criterion and F-criterion. Czarnocka and Slade (2000) used the PTSD-Q (Watson, Juba, Manifold, Kucala, & Anderson, 1991) which is comparable in design to the PSS, and also used the Impact of Event Scale (IES) (Horowitz, Wilner, & Alvarez, 1979) to investigate intrusive and avoidance symptoms. Skari et al. (2002) combined two

questionnaires to assess a PTSD-like response using the IES and items of the General Health Questionnaire (GHQ-28) concerning hyperarousal. This combination of instruments does not exactly follow the diagnostic criteria of PTSD in the DSM-IV, and therefore, comparison of prevalence rates and interpretation of the results is somewhat complicated. In addition, Skari et al. (2002) used a different cut-off score than Allen (1998) and Lyons (1998). Use of different cut-off scores may result in different rates of clinically significant levels of posttraumatic stress symptoms. Although these questionnaires relate the items to the experience of childbirth, the experience itself is not assessed according to the stressor criteria of the DSM-IV criteria, which is crucial for diagnosing PTSD. Finally, although the IES (Horowitz et al., 1979) is one of the most frequently used self-report measures of posttraumatic stress responses, the original version questionnaire lacks items pertaining to hyperarousal and only measures symptoms of avoidance and intrusion, but not exactly according to the B and C-criteria following the DSM-IV.

None of the studies used a systematic diagnostic interview to assess PTSD such as the SCID or the CIDI, in contrast to some other studies in the traumatic stress field (Freedman, Brandes, Peri, & Shalev, 1999; Shalev et al., 1998). Self-report questionnaires are prone to bias and different interpretations of questions, and give no opportunity to ask further information. A combination of clinical interviews and standardized questionnaires is ideal. Therefore, results of the studies on traumatic childbirth based only on one form of assessment should be regarded with some caution.

3.3. *Sample characteristics*

Participants in the quantitative studies differed in number and characteristics hindering validity of results. Therefore, we should be careful drawing general conclusions. First, small sample sizes of 20 to 42 participants (Allen, 1998; Keogh et al., 2002; Lyons, 1998) make generalizations to larger populations problematic.

Secondly, recruitment of women may have influenced results. Lyons (1998) used only first time mothers in a small sample, so no conclusions could be drawn for multiparous women. Allen (1998) selected only women who perceived their delivery as traumatic, and who were interviewed during their 8-month developmental check-up. Such retrospective reports tend to be less accurate. Czarnocka and Slade (2000) selected only in-patients of a hospital, probably a more vulnerable group than out-patients who leave the hospital soon after delivery. Soet et al. (2003) selected women attending birth classes. Because of low rates of multiparous women and women from lower social economic status, and a higher average cesarean rate, this sample was not representative of childbearing women in USA.

Thirdly, samples could have changed due to drop out. Ayers and Pickering (2001) pointed out that non-responders were significantly younger and less educated, and comprised a higher proportion of African and Afro-Caribbean women and single or separated women. Soet et al. (2003) reported that Caucasian women were more likely to complete the postpartum interview. Responders differed from non-responders in the study of Czarnocka and Slade (2000) in that non-responders had more children and followed less antenatal classes. It can be assumed that women who dropped out of the studies had to cope with more difficulties and were therefore less willing and able to continue participation, but are more at high-risk for PTSD. Consequently, drop-out may have tempered prevalence rates. On the other hand, prevalence rates could be artificially high as women who suffer from posttraumatic stress symptoms may be more motivated to participate than women who do not suffer from these symptoms. This is an important issue, because people who refuse to participate in traumatic stress studies appear to have more mental health problems (Weisaeth, 1989).

4. Methodological issues regarding risk factors

Factors predictive for posttraumatic stress symptoms and PTSD in the general trauma literature (e.g. Brewin, Andrews, & Valentine, 2000) were also found to be predictive in various studies on childbirth-related PTSD and related symptoms. Characteristics of the event, personality characteristics, pain and lack of social support were related to childbirth-related PTSD and posttraumatic stress symptoms (Allen, 1998; Ayers & Pickering, 2001; Creed et al., 2000; Czarnocka & Slade, 2000; Keogh et al., 2002; Lyons, 1998; Skari et al., 2002; Soderquist et al., 2002; Soet et al., 2003; Wijma et al., 1997). However, just as in general trauma literature, findings concerning the specific nature and the specific contribution of the various risk factors differ between studies. So, some critical remarks must be made.

4.1. Personality dispositions

Personality as a risk factor for PTSD has been studied in relation to various forms of trauma. For instance, support has been found for neuroticism and extraversion as risk factors in several studies (Breslau, Davis, & Andreski, 1995; Schnurr & Vielhauer, 1999). However, recent meta-analyses on predictors of PTSD did not find personality traits to be influential (Brewin et al., 2000; Ozer, Best, Lipsey, & Weiss, 2003). In studies on posttraumatic stress related to childbirth, neuroticism as a personality disposition was found to be related to posttraumatic stress symptoms in a small sample of first-time mothers (Lyons, 1998).

The most frequent studied personality trait in childbirth-related studies on PTSD is trait anxiety. In three studies an association between trait anxiety and posttraumatic stress symptoms was found. Czarnocka and Slade (2000) reported a relation between trait anxiety short after delivery measured with the State Trait Anxiety Inventory (STAI) and posttraumatic stress symptoms. More interestingly, in two studies trait anxiety (also assessed with the STAI) was measured *before* delivery, one study reporting an association (Soet et al., 2003), and the other study not (Creedy et al., 2000). Perhaps the difference in number of respondents (103 versus 499) could explain this difference. In addition to these findings, Keogh et al. (2002) reported that anxiety sensitivity, which is associated with the fear of anxiety-related sensations, was related to posttraumatic stress symptoms, strengthening the evidence for a relation between anxiety as a trait and posttraumatic stress symptoms. Unfortunately, other personality dispositions have not been studied in the field of childbirth-related PTSD.

4.2. Obstetric procedures

Different obstetric procedures, such as emergency cesarean section, forceps delivery, ventous extraction, epidural and episiotomy, have been found to be related to posttraumatic stress symptoms and a PTSD-profile. An obstetric procedure may add to the adversity of the delivery experience, increasing the traumatic character of the event. The predictive validity of these procedures, however, is unclear, because some studies did not find an association between these procedures and posttraumatic stress symptoms (Lyons, 1998; Skari et al., 2002; Soet et al., 2003; Wijma et al., 1997). Although deliveries done by EmCs or with the use of instruments appear to be stronger associated with posttraumatic stress symptoms (Ryding et al., 1998a; Soderquist et al., 2002), normal vaginal deliveries were also associated with the development of posttraumatic stress symptoms (Soderquist et al., 2002). This may suggest that factors other than obstetrical procedures as such are responsible for the development of symptoms. Also

in studies on other forms of trauma, such as on violent crime and combat, the relation between the intensity of the traumatic event and the development of PTSD has not been found to be consistent. In addition, similar risk factors, such as feeling wronged by the staff, negative previous experiences as a patient and a poor relationship with the partner associated with posttraumatic stress after EmCs (Ryding et al., 1998a, 2000), have also been found in relation to normal vaginal deliveries. So it seems plausible to suggest that objective obstetrical procedures may become traumatic under certain circumstances.

To illustrate, in the study of Soet et al. (2003) characteristics of the event were more salient predictors for experiencing birth as traumatic than psychosocial factors such as social support, history of sexual trauma or pain expectation. However, when exploring the predictors of development of posttraumatic stress symptoms, antecedent or psychosocial factors were the most salient predictors. Therefore, obstetric interventions may play a role in perceiving childbirth as traumatic (Soet et al., 2003), but other more personal or subjective factors have a mediating role in the subsequent development of posttraumatic stress symptoms.

4.3. Pain

In the general trauma literature, pain was found to be related to the development of PTSD (Fedoroff, Taylor, Asmundson, & Koch, 2000; Schreiber & Galai-Gat, 1993). Pain during delivery is a very common experience, but it is not necessarily associated with the development of posttraumatic stress symptoms. In studies on posttraumatic stress related to childbirth just one study found an association between the experience of pain during labor and the development of posttraumatic stress symptoms (Soet et al., 2003). Two other studies that investigated pain reported that the experience of pain during delivery increased feelings of distress with the increased distress being related to the development of posttraumatic stress symptoms (Czarnocka & Slade, 2000; Lyons, 1998). Accordingly, Allen (1998) reported in a qualitative analysis that pain was related to increased distress and that for 50% of the women in that sample perceived pain was an indication that their own life was being threatened. These results suggest that level of distress caused by the experience of pain is related to posttraumatic stress above the level of pain itself. Experiencing pain is not necessarily harmful but it may lead to catastrophic interpretations which may be the reason that childbirth can be a traumatic experience with negative psychiatric consequences. Therefore, the specific role of pain and the interpretation of it need to be investigated thoroughly.

4.4. Staff–patient interaction

Staff–patient interaction is an important aspect in the delivery process, and the staff is responsible for guiding the mother through a physical as well as an emotional challenging event. Negative aspects of staff–patient interaction were found to be related with posttraumatic stress symptoms and a PTSD-profile. One should be cautious, however, in interpreting these results, because of the varying descriptions of the staff–patient contact, including: rating contact with staff in negative terms, disappointment in intrapartum care, perception of staff as less supportive, dissatisfaction about communication with the staff, and feelings of being wronged by the staff. Some descriptions pointed to specific communicative aspects, such as getting support, and sufficient and valid information, others to a global disappointment in the intrapartum care. Because of these different descriptions it remains uncertain which aspects of staff–patient interaction are crucial.

4.5. Giving birth as a traumatic experience

Approximately one third of the women perceived their delivery as traumatic, fulfilling the A-criterion of DSM-IV. A much smaller part of women eventually developed a PTSD-profile, indicating that a traumatic childbirth experience does not automatically lead to a pathological response. On the other hand, posttraumatic stress symptoms have also been assessed in women who did not perceive delivery as traumatic (Soet et al., 2003). First, this could imply these women already suffered from posttraumatic stress due to another prepartum traumatic experience. Second, as Soet et al. (2003) suggested, there may be a reluctance of admitting a negative birth experience, because strong societal pressures exist on women to be happy with giving birth. A third explanation is that the typical avoidance symptoms of PTSD could be responsible for not reporting a traumatic experience. Fourthly, women may not report their delivery as traumatic because of the occurrence of dissociative reactions during delivery. As amnesia is one of the dissociative symptoms, the memory of the childbirth experience could be troubled by perinatal dissociative reactions. Peritraumatic dissociation has been mentioned in three studies on perinatal PTSD but has not yet been empirically investigated as a risk factor in studies on traumatic childbirth (Allen, 1998; Moleman et al., 1992; Soderquist et al., 2002). Peritraumatic dissociation has been identified as a risk factor for PTSD in various studies on other forms of trauma (Freedman et al., 1999; Shalev et al., 1998). In the meta-analysis of Ozer et al. (2003), peritraumatic dissociation was found to be the strongest predictor of PTSD. Also, cognitive appraisals of aspects of the event have been found to contribute to PTSD in others forms of trauma. In studies on childbirth, however, these factors have not yet been investigated.

5. Clinical implications

Although not the focus of this review, the finding that childbirth can be a traumatic experience has implications for clinical practice. Firstly, health practitioners should be aware of the fact that PTSD and posttraumatic stress symptoms may develop as a consequence of childbirth. Secondly, various authors have suggested the need for primary and secondary prevention (Ayers & Pickering, 2001; Creedy et al., 2000; Lyons, 1998). Primary prevention may include the preparation of all pregnant women in a realistic way for labor and birth. Such preparation should include providing information to all pregnant women on the incidence of obstetric interventions and the associated risks and benefits (Creedy et al., 2000). Secondly, it should inform them about the possibilities of childbirth, since medical professionals often cannot predict prior to the birth who will, or will not require medical interventions. Another form of primary prevention that can be used in the future may include the detection of those pregnant women who may be vulnerable by screening for known vulnerability factors. As research in this area is still in an early state it is difficult to identify those women at risk and those not at risk, because more information is needed on risk factors for childbirth-related PTSD.

Secondary prevention may include screening women following childbirth for severe traumatic stress responses. For this purpose, health practitioners should have access to screening instruments for trauma symptoms; they should also be able to provide emotional support in the form of postpartum care or debriefing. There are various forms of early intervention after trauma. A well-known intervention is psychological debriefing (Van Emmerik, Kamphuis, Hulsbosch, & Emmelkamp, 2002).

However, there is little empirical evidence on its effectiveness. A recent study on stress debriefing after childbirth pointed out that critical incident stress debriefing (CISD) was not effective in preventing postnatal psychological disorders, but had no adverse effects (Priest, Henderson, Evans, & Hagan, 2003).

Rather than providing critical incident stress debriefing to women following childbirth, Boyce and Concon (2000) suggested to offer them the opportunity to discuss their delivery experience preferably with the midwife or obstetrician involved. In addition, there are good alternatives for treating acute stress problems. Brief cognitive behavior therapy showed long-term benefits for people who are at risk for developing PTSD (Bryant, Moulds, & Nixon, 2003). Foa, Hearst-Ikeda, and Perry (1995) examined the effectiveness of a brief cognitive-behavioral program for prevention of PTSD in women who were recently assaulted. This program proved to be effective on posttraumatic stress symptoms, as well as depressive symptoms.

In summary, the following psychosocial approach is recommended: First, provide crisis management to women who are most acutely upset. These women could be identified through screening in the days following delivery. Second, provide an environment of support where women know that strong emotions are common after childbirth and specialized staff members (midwives, gynecologists, psychologists) are available to talk should they want this. As a part of this, make supportive medical care available that relates to the concerns of the women following childbirth. Finally, refer those women who continue to have significant posttraumatic stress reactions that interfere with functioning approximately two months after delivery for several sessions of a cognitive behavior therapy prevention program.

6. Conclusion

Case studies and quantitative studies support the notion that childbirth is a traumatic event for a small minority of women. Case studies described in depth women who suffered childbirth-related PTSD, quantitative studies found empirical evidence for characteristic posttraumatic stress symptoms and PTSD in women who had given birth regularly to a child. Prevalence of stress-related symptoms appeared to be ranging from 24% at six weeks after vaginal deliveries (Czarnocka & Slade, 2000) to around 50% one to two months after emergency cesarean section (Ryding et al., 1997). Prevalence rates of PTSD were lower, ranging between 2.8% and 5.6% at around six weeks postpartum to approximately 1.5% 6 months postpartum. These numbers would imply that for instance in the Netherlands, with over 200,000 births annually, at least 3000 women a year may suffer from PTSD as a consequence of delivery at six months postpartum.

Support has been found for the following antenatal risk factors: history of previous mental health difficulties, previous traumatic childbirth, and trait anxiety. Perinatal risk factors identified were feelings of lack or loss of control over the event, intense emotional distress, and lack of support by medical staff and the partner. Furthermore, specific obstetric intervention may be considered as predictors of posttraumatic symptoms, such as forceps delivery, ventous extraction, episiotomy, emergency and elective cesarean section. However, also normal vaginal deliveries may lead to posttraumatic stress symptoms, indicating that such symptoms are most likely predicted by a combination of factors. As Brewin et al. (2000) pointed out in their meta-analysis, it is inadvisable to create a single risk factor model for PTSD. Our review points out that a variety of pre- and

peritraumatic factors are associated with the development of posttraumatic stress symptoms and PTSD following childbirth. Still little is known about post-trauma risk factors such as additional negative life events, social support and the changes in daily life caused by getting a child. These aspects need further investigation.

The study of childbirth-related PTSD offers the opportunity to prospectively study the development of posttraumatic stress reactions in a heterogeneous group of women. Because of the anticipated and inevitable outcome of pregnancy, pre-measures can be conducted before the event of childbirth has happened. Peritraumatic measures can be planned because of the good predictability of the date of birth. Therefore, the role of acute stress responses as well as other determinants (e.g., personality dispositions) can be studied in a rather standardized timely fashion. Furthermore, studies on posttraumatic stress related to childbirth should investigate the role of acute stress reactions. Acute stress reactions may predict the development of posttraumatic stress symptoms, although their predictive power is uncertain. Some reactions may be more predictive than others, for example, peritraumatic dissociative reactions. Brewin, Andrews, Rose, and Kirk (1999) found, with regard to other traumatic events, that a simple threshold of three or more intrusive symptoms, assessed at three weeks post-trauma, was sufficient to predict later PTSD with a high degree of accuracy. Finally, longer longitudinal studies are necessary to investigate the chronic character of childbirth-related posttraumatic stress. No studies exist that have investigated childbirth-related posttraumatic stress longer than six months postpartum. Consequently, important questions remain unanswered with regard to the detection of posttraumatic stress symptoms in an early stage and the analysis of factors determining the course of development of PTSD after childbirth.

In conclusion, although previously overlooked, the existing research so far indicates partus-related posttraumatic stress symptoms and PTSD constitute a serious mental health problem. Posttraumatic stress symptoms or PTSD related to childbirth need more attention from health practitioners in the field of pregnancy, delivery and postpartum care, as well as from researchers in the field of psychological trauma.

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References

- 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. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). (DSM-III). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Arizmendi, T. G., & Affonso, D. D. (1987). Stressful events related to pregnancy and postpartum. *Journal of Psychosomatic Research*, 31, 743–756.
- Ayers, S., & Pickering, A. D. (2001). Do women get posttraumatic stress disorder as a result of childbirth? A prospective study of incidence. *Birth*, 28, 111–118.

- Ballard, C. G., Stanley, A. K., & Brockington, I. F. (1995). Post-traumatic stress disorder (PTSD) after childbirth. *British Journal of Psychiatry*, *166*, 525–528.
- Beech, B. A., & Robinson, J. (1985). Nightmares following childbirth. *British Journal of Psychiatry*, *147*, 586.
- Bowles, S. V., James, L. C., Solursh, D. S., Yancey, M. K., Epperly, T. D., & Folen, R. A. (2000). Acute and post-traumatic stress disorder after spontaneous abortion. *American Family Physician*, *61*, 1689–1696.
- Boyce, P., & Concon, J. (2000). Traumatic childbirth and the role of debriefing. In B. Raphael, & J. P. Wilson (Eds.), *Psychological debriefing: Theory, practice and evidence* (pp. 272–280). New York: Cambridge University Press.
- Breslau, N., Davis, G. C., & Andreski, P. (1995). Risk factors for PTSD-related traumatic events: A prospective analysis. *American Journal of Psychiatry*, *152*, 529–535.
- Brewin, C. R., Andrews, B., Rose, S., & Kirk, M. (1999). Acute stress disorder and posttraumatic stress disorder in victims of violent crime. *American Journal of Psychiatry*, *156*, 360–366.
- 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*, 748–766.
- Brockington, I. F. (1996). *Motherhood and mental health*. Oxford: Oxford University Press.
- Bryant, R. A., Moulds, M. L., & Nixon, R. V. (2003). Cognitive behaviour therapy of acute stress disorder: A four-year follow-up. *Behaviour Research and Therapy*, *41*, 489–494.
- Bydlowski, M., & Raoul-Duval, A. (1978). Un avatar psychique méconnu de la puerpéralité: La névrose traumatique post-obstétricale. *Perspectives Psychiatriques*, *4*, 321–328.
- Charles, C. (1997). When the dream goes wrong . . . post-traumatic stress disorder. *Midwives*, *110*, 250–252.
- Church, S., & Scanlan, M. (2002). Post-traumatic stress disorder after childbirth: Do midwives have a preventative role? *The Practising Midwife*, *5*, 10–13.
- Creedy, D. K., Shochet, I. M., & Horsfall, J. (2000). Childbirth and the development of acute trauma symptoms: Incidence and contributing factors. *Birth*, *27*, 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.
- DeMier, R. L., Hynan, M. T., Harris, H. B., & Manniello, R. L. (1996). Perinatal stressors as predictors of symptoms of posttraumatic stress in mothers of infants at high risk. *Journal of Perinatology*, *16*, 276–280.
- Engelhard, I. M., Van den Hout, M. A., & Arntz, A. (2001). Posttraumatic stress disorder after pregnancy loss. *General Hospital Psychiatry*, *23*, 62–66.
- Fedoroff, I. C., Taylor, S., Asmundson, G. J. G., & Koch, W. J. (2000). Cognitive factors in traumatic stress reactions: Predicting PTSD symptoms from anxiety sensitivity and beliefs about harmful events. *Behavioural and Cognitive Psychotherapy*, *28*, 5–15.
- Foa, E. B., Hearst-Ikeda, D., & Perry, K. J. (1995). Evaluation of a brief cognitive-behavioral program for the prevention of chronic PTSD in recent assault victims. *Journal of Consulting and Clinical Psychology*, *63*, 948–955.
- Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *Journal of Traumatic Stress*, *6*, 459–473.
- Fones, C. (1996). Posttraumatic stress disorder occurring after painful childbirth. *Journal of Nervous and Mental Disease*, *184*, 195–196.
- Freedman, S. A., Brandes, D., Peri, T., & Shalev, A. (1999). Predictors of chronic post-traumatic stress disorder: A prospective study. *British Journal of Psychiatry*, *174*, 353–359.
- Harvey, A. G., & Bryant, R. A. (2002). Acute stress disorder: A synthesis and critique. *Psychological Bulletin*, *128*, 886–902.
- Hofberg, K., & Brockington, I. (2000). Tokophobia: An unreasoning dread of childbirth. A series of 26 cases. *British Journal of Psychiatry*, *176*, 83–85.
- Holditch-Davis, D., Bartlett, T. R., Blickman, A. L., & Miles, M. S. (2003). Posttraumatic stress symptoms in mothers of premature infants. *Journal of Obstetric, Gynecological and Neonatal Nursing*, *32*, 161–171.
- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine*, *41*, 209–218.
- Hunfeld, J. A., Wladimiroff, J. W., & Passchier, J. (1997). Prediction and course of grief four years after perinatal loss due to congenital anomalies: A follow-up study. *British Journal of Medical Psychology*, *70*, 85–91.
- Keogh, E., Ayers, S., & Francis, H. (2002). Does anxiety sensitivity predict post-traumatic stress symptoms following childbirth? A preliminary report. *Cognitive Behaviour Therapy*, *31*, 145–155.

- Kleber, R. J., & Brom, D. (1992). *Coping with trauma*. Amsterdam/Berwyn, Pennsylvania: Swets & Zeitlinger International.
- Lyons, S. (1998). A prospective study of post traumatic stress symptoms 1 month following childbirth in a group of 42 first-time mothers. *Journal of Reproductive and Infant Psychology*, *16*, 91–105.
- Menage, J. (1993). Women's perception of obstetric and gynecological examinations. *British Medical Journal*, *306*, 1127–1128.
- Moleman, N., Van der Hart, O., & Van der Kolk, B. A. (1992). The partus stress reaction: A neglected etiological factor in postpartum psychiatric disorders. *Journal of Nervous and Mental Disease*, *180*, 271–272.
- 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*, 52–73.
- Pierrehumbert, B., Nicole, A., Muller-Nix, C., Forcada-Guex, M., & Ansermet, F. (2003). Parental post-traumatic reactions after premature birth: Implications for sleeping and eating problems in the infant. *Archives of Disease in Childhood*, *88*, 400–404.
- Priest, S. R., Henderson, J., Evans, S. F., & Hagan, R. (2003). Stress debriefing after childbirth: A randomised controlled trial. *Medical Journal of Australia*, *178*, 542–545.
- Reynolds, J. L. (1997). Post-traumatic stress disorder after childbirth: The phenomenon of traumatic birth. *Canadian Medical Association Journal*, *156*, 831–835.
- Ryding, E. L., Wijma, B., & Wijma, K. (1997). Posttraumatic stress reactions after emergency cesarean section. *Acta Obstetrica et Gynecologica Scandinavica*, *76*, 856–861.
- Ryding, E. L., Wijma, K., & Wijma, B. (1998a). Predisposing psychological factors for posttraumatic stress reactions after emergency cesarean section. *Acta Obstetrica et Gynecologica Scandinavica*, *77*, 351–352.
- Ryding, E. L., Wijma, K., & Wijma, B. (1998b). Psychological impact of emergency cesarean section in comparison with elective cesarean section, instrumental and normal vaginal delivery. *Journal of Psychosomatic Obstetrics and Gynaecology*, *19*, 135–144.
- Ryding, E. L., Wijma, K., & Wijma, B. (2000). Emergency cesarean section: 25 women's experiences. *Journal of Reproductive and Infant Psychology*, *18*, 33–39.
- Schnurr, P. P., & Vielhauer, M. J. (1999). Personality as a risk factor. In R. Yehuda (Ed.), *Risk factors for posttraumatic stress disorder* (pp. 191–222). Washington, DC: American Psychiatric Press.
- Schreiber, S., & Galai-Gat, T. (1993). Uncontrolled pain following physical injury as the core-trauma in post-traumatic stress disorder. *Pain*, *54*, 107–110.
- Seng, J. S., Oakley, D. J., Sampsel, C. M., Killion, C., Graham-Bermann, S., & Liberzon, I. (2001). Posttraumatic stress disorder and pregnancy complications. *Obstetrics and Gynecology*, *97*, 17–22.
- Shalev, A. Y., Freedman, S., Peri, T., Brandes, D., Sahar, T., Orr, S. P., et al. (1998). Prospective study of posttraumatic stress disorder and depression following trauma. *American Journal of Psychiatry*, *155*, 630–637.
- Skari, H., Skreden, M., Malt, U. F., Dalholt, M., Ostensen, A. B., 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 Gynaecology*, *23*, 31–39.
- Soet, J. E., Brack, G. A., & DiIorio, C. (2003). Prevalence and predictors of women's experience of psychological trauma during childbirth. *Birth*, *30*, 36–46.
- Turton, P., Hughes, P., Evans, C. D., & Fainman, D. (2001). Incidence, correlates and predictors of post-traumatic stress disorder in the pregnancy after stillbirth. *British Journal of Psychiatry*, *178*, 556–560.
- Van Emmerik, A. A., Kamphuis, J. H., Hulsbosch, A. M., & Emmelkamp, P. M. (2002). Single session debriefing after psychological trauma: A meta-analysis. *Lancet*, *360*, 766–771.
- Watson, C. G., Juba, M. P., Manifold, V., Kucala, T., & Anderson, P. E. (1991). The PTSD interview: Rationale, description, reliability, and concurrent validity of a DSM-III-based technique. *Journal of Clinical Psychology*, *47*, 179–188.
- Weisaeth, L. (1989). Importance of high response rates in traumatic stress research. *Acta Psychiatrica Scandinavica*, *80*(Suppl. 355), 131–137.
- Wijma, K., Soderquist, J., & Wijma, B. (1997). Posttraumatic stress disorder after childbirth: A cross sectional study. *Journal of Anxiety Disorders*, *11*, 587–597.