



## Traumatic stress in late pregnancy

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Received 18 December 2001; received in revised form 8 March 2002; accepted 29 April 2002

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### Abstract

Traumatic stress has traditionally been studied in the aftermath of traumatic events. In contrast, this study aimed to explore if traumatic stress can occur before an event that is perceived as threatening or feared. Traumatic stress, as related to the forthcoming delivery, was studied in 1224 women. Background data and psychological characteristics were assessed in early pregnancy and traumatic stress and fear of childbirth in late pregnancy. Of all subjects, 2.3% met all DSM-IV criteria for posttraumatic stress disorder (PTSD) and 5.8% fulfilled criteria B, C, and D in late pregnancy. Traumatic stress and fear of childbirth correlated significantly. High trait anxiety, depressive symptomatology, psychological/psychiatric counseling related to childbirth, and self-reported psychological problems, measured in early pregnancy, were risk factors for traumatic stress and fear of childbirth in late pregnancy. Results suggest the occurrence of “pre”traumatic stress (i.e., a threatening forthcoming event provoking symptoms similar to those after a traumatic event).

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*Keywords:* Pregnancy; Traumatic stress; Fear of childbirth; Depression; Anxiety

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### 1. Introduction

People who have experienced a traumatic event may suffer from symptoms of traumatic stress, as in posttraumatic stress disorder (PTSD, APA, 1994). The main

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symptoms of PTSD include persistent reexperiencing of the traumatic event, persistent avoidance of stimuli associated with it, numbing of general responsiveness, and symptoms of increased arousal. According to DSM-IV, the traumatic event is the primary cause of traumatic stress symptoms and PTSD that may develop after such an event.

In DSM-IV, PTSD-reactions are explained by the traumatic event itself. However, most people do not develop a full-blown PTSD after a traumatic event (Bowman, 1999). Previous research on posttraumatic stress responses has shown that pretrauma characteristics (e.g., depression, anxiety, prior trauma, psychological/psychiatric problems) explain more individual differences than event characteristics (i.e., severity and nature of the event, Blanchard et al., 1996; Bowman, 1999; McFarlane, 1988, 2000). Also, there seems to be a buffering effect of social support as well as benefits of coping skills on people's well-being after stressful events (Cohen & Wills, 1985; Jones & Barlow, 1990). These pretrauma and characteristics could then be viewed as either vulnerability factors to the onset of symptoms of traumatic stress and PTSD, or, as intermediating factors between the traumatic event and the onset of symptoms. In summary, more factors than just the stressor itself seem to play an important role in the development of traumatic stress.

The childbirth experience has been recognized as a possible stressor of enough intensity to cause traumatic stress reactions (Czarnecka & Slade, 2000; Menage, 1993; Reynolds, 1997; Ryding, Wijma, & Wijma, 1998b; Wijma, Söderquist, & Wijma, 1997). In a cross sectional study, the prevalence of a PTSD symptom profile (related to a recent delivery) was 1.7% among 1640 delivered women, 1–13 months after the delivery (Wijma et al., 1997). In a more recent study of delivery related PTSD, Czarnecka and Slade concluded that 3% of 298 women met the PTSD symptom criteria at 6 weeks postpartum (Czarnecka & Slade, 2000).

A traumatic childbirth differs significantly from other traumatic events. The delivery is expected from the day a woman knows that she is pregnant. However, the forthcoming delivery has both predictable and unpredictable aspects. The delivery is predictable because the woman knows that the delivery eventually will occur, but unpredictable in the sense that she does not know her individual course of the delivery. Partly because of this uncertainty, childbirth is a situation that many women fear and perceive as a threat (Areskog, Uddenberg, & Kjessler, 1981; Ryding, Wijma, Wijma, & Rydhström, 1998a). Wijma et al. found that a PTSD symptom profile after the delivery was related to postpartum fear of childbirth (i.e., a negative cognitive appraisal of the recent delivery, Wijma et al., 1997). Moreover, Zar et al. found fear of childbirth in pregnancy week 32 to be substantially correlated with postpartum fear of childbirth ( $r = .60-.67$ , in nulliparous and parous women, respectively, Zar, Wijma, & Wijma, 2001).

In conclusion, individual differences in traumatic stress reactions can be explained by how a person appraises a potentially traumatic event and by the

pretrauma characteristics mentioned previously (Lazarus & Folkman, 1984; Spaccarelli, 1994; Stallard, Velleman, & Baldwin, 1998). Then, if the occurrence of traumatic stress symptoms are closely related to the individual appraisal of an event, one can expect to find these symptoms among people who have been confronted with an event that he/she appraises as traumatic, no matter of the “objective” severity and nature of the event. Hence, symptoms of traumatic stress can be expected to exist also among individuals who appraise a future event as traumatic, e.g., a forthcoming delivery. Such “pre”traumatic stress has been described by Kiser et al., who studied the psychological effects of a disaster warning (i.e., an event that has not yet occurred) on children and adolescents (Kiser et al., 1993). The authors documented mild PTSD-like reactions that were related to the prediction of an earthquake that in fact never happened. Possibly, similar symptoms exist among pregnant women who appraise the forthcoming delivery as threatening.

The main focus of this study was to investigate occurrence of traumatic stress symptoms (in late pregnancy), related to the forthcoming delivery, and their possible predictors (in early pregnancy). The following hypotheses were raised:

1. Traumatic stress symptoms do occur among women in late pregnancy.
2. Traumatic stress symptoms and fear of childbirth, as measured in late pregnancy, are positively related.
3. Individual characteristics, such as high trait anxiety, depressive symptomatology, low stress coping ability, low perceived social support, previous experiences of traumatic events, and a history of previous psychological/psychiatric counseling related to childbirth, as measured in early pregnancy, are related to the occurrence of traumatic stress symptoms and severe fear of childbirth in late pregnancy.

## **2. Method**

### *2.1. Participants*

Participants were consecutively recruited among pregnant women who, in 1997, visited the Department of Obstetrics and Gynecology in Linköping or Kalmar, in south-east Sweden, for their first ultrasound examination during pregnancy. The ultrasound examination took place in gestation weeks 12–15 in Linköping and weeks 16–20 in Kalmar. Inclusion criteria for the studied pregnant population were: (1) speaking/understanding Swedish, (2) no plans of legal abortion, (3) absence of obstetric complications that needed specialist ultrasound examination.

Of 1974 eligible women, 1224 participated at Time 1 (62%). At Time 2 another 273 women dropped out, leaving 951 women for analysis (78% of 1224).

## 2.2. Procedure

The midwives marked the names of the women who met inclusion criteria and passed the names to the research group. The women were sent an invitation to participate in the study, along with a set of questionnaires. Participants were assessed twice during pregnancy, in gestation weeks 12–20 and 32. Predictors (background variables) were measured at Time 1 and criterion variables were measured at Time 2 (traumatic stress symptoms and fear of childbirth).

## 2.3. Predictors—Time 1

The background data questionnaire comprised age, gestation week, parity, educational level, civil status, and previous psychological/psychiatric counseling, previous experience of any traumatic events (and to specify what event that was) and if the respondent ever had suffered from anxiety/panic, phobia, depression, psychoses/schizophrenia, or obsessive/compulsive behavior or thoughts, or other not specifically defined psychological problems (Table 1).

Trait anxiety was measured by means of the trait version of the State-Trait Anxiety Inventory (STAI, minimum score = 20, maximum score = 80, Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Sum-scores were dichotomized at the top 25th percentile, meaning that scores  $\geq 37$  were regarded as high trait anxiety and scores  $< 37$  as low. Internal consistency was assessed by means of Cronbach's  $\alpha = .91$  (Carmines & Zeller, 1988).

Depressive symptomatology was measured with the Beck Depression Inventory (BDI, Beck, Ward, Mendelsohn, Mock, & Earbaugh, 1961, Table 1). Seven items (15–21) were excluded in the analysis because they refer to somatic symptoms, which may be related to pregnancy. A cut-off point at 13 has been recommended for mild depression when all items are included (Beck & Beamesderfer, 1974). Therefore, we calculated the corresponding score for the data we used (i.e.,  $\{13/21\} \times 14 = 8.66$ , minimum score = 0, maximum score = 42). Thus, the cut-off point was set at 9, meaning that a score  $\geq 9$  was counted as a depressive symptomatology. Cronbach's  $\alpha = .82$  on the 14 BDI-items.

Stress coping ability was obtained via the Stress Coping Inventory (SCI), which is developed to assess the individual's appraisal of her adaptive resources to deal with stressful situations (Ryding et al., 1998b). In the SCI the woman is instructed to rate how often she thinks she is able to cope with 41 stressful situations. The answers are rated on a 6-point Likert scale ranging from "almost never" (=1), "rarely" (=2), "occasionally" (=3), "rather often" (=4), "very often" (=5), "almost always" (=6, minimum score = 41, maximum score = 246). Sum-scores  $\leq 164$  (the lower 25th percentile) were considered to represent low coping abilities and  $> 164$  good coping abilities. The SCI has previously been used in a study of psychological well-being after emergency cesarean section, and was found to have sound reliability (Cronbach's  $\alpha = .94$ , and split-half reliability = .93, Ryding et al., 1998b). In the present study Cronbach's  $\alpha = .95$ .

Table 1  
Subjects who participated at Time 1 and 2

Background variables	Linköping <i>n</i> = 508 (%)	Kalmar <i>n</i> = 443 (%)		
Age (min–max: 15–45, mean, S.D.)	28.7 ± 4.3	28.8 ± 4.7	<i>t</i> = .42 <i>df</i> = 948	<i>P</i> = .67
Pregnancy week (mean, S.D.)	16.7 ± 2.6	20.0 ± 2.8	<i>t</i> = 18.4 <i>df</i> = 939	<i>P</i> < .0001
Parity			$\chi^2 = .47$ <i>df</i> = 1	<i>P</i> = .51
Nulliparous	206 (41)	170 (38)		
Parous	302 (59)	273 (62)		
Education			$\chi^2 = 7.9$ <i>df</i> = 4	<i>P</i> = .09
Mandatory school	26 (5)	28 (6)		
High school	194 (38)	202 (46)		
University <3 years	86 (17)	68 (15)		
University ≥3 years	115 (23)	78 (18)		
Other	87 (17)	65 (15)		
Civil status			$\chi^2 = .33$ <i>df</i> = 2	<i>P</i> = .85
No partner	4 (1)	5 (1)		
Has a partner but not cohabiting	10 (2)	8 (2)		
Married or cohabiting	494 (97)	429 (97)		
Previous psychiatric/psychological counseling			$\chi^2 = 6.8$ <i>df</i> = 3	<i>P</i> = .08
No	435 (86)	380 (86)		
Yes, pregnancy/childbirth related	12 (2)	9 (2)		
Yes, in other situations	49 (10)	51 (11.5)		
Yes, in both cases	12 (2)	2 (.5)		
Traumatic experiences (traumatic births excluded)			$\chi^2 = .03$ <i>df</i> = 1	<i>P</i> = .88
No	368 (76)	315 (75)		
Yes	117 (24)	103 (25)		
Traumatic birth experiences <sup>a</sup>			$\chi^2 = 3.5$ <i>df</i> = 1	<i>P</i> = .07
No	289 (96)	251 (92)		
Yes	13 (4)	22 (8)		
Previous psychiatric problems				
0. No previous problems	278	227		
1. Anxiety/panic	24	25		
2. Phobia	66	75		
3. Depressed mood	60	44		
4. Psychosis/schizophrenia	1	1		
5. Obsessive/compulsive behavior	1	2		
6. Other	4	4		
Combinations of 1 and 2	12	11		
Combinations of 1 and 3	16	7		
Combinations of 2 and 3	18	13		
Combinations of 1, 2 and 3	16	18		
Other combinations	8	10		
Present depressive symptomatology			$\chi^2 = .0001$ <i>df</i> = 1	<i>P</i> > .99
No	484 (95.3)	422 (95.3)		
Yes	24 (4.7)	21 (4.7)		

<sup>a</sup> Only parous women included.

The Social Contact Questionnaire (specifically developed for this study) regarded participants' perceived social support from partner, family and friends. The questionnaire consists of 18 statements on which subjects are asked to rate their perception of social support, ranging five steps: "seldom" (=1), "sometimes" (=2), "often" (=3), "very often" (=4) and "almost always" (=5, minimum score = 18, maximum score = 90). Sum-scores were dichotomized at the lower 25th percentile, i.e., scores  $\leq 64$  were regarded as low social support and  $>64$  as high. Cronbach's  $\alpha = .88$ .

#### 2.4. Criterion variables—Time 2

The Traumatic Event Scale (TES) was used to measure traumatic stress symptoms, related to the forthcoming delivery. The TES was developed in accordance with the DSM-IV criteria for PTSD and comprises the stressor criterion (criterion A) and all symptom criteria for PTSD (APA, 1994). Criterion A is assessed through four questions that are adjustable for the specific trauma of interest (a more detailed description has been presented previously (Wijma et al., 1997). After criterion A, statements comprising the 17 DSM-IV PTSD symptoms follow (criteria B, C, and D, i.e., intrusive thoughts, avoidance and numbing, and arousal). Subjects were asked to report frequency of the symptoms, described in the statements, by marking one of four answers: "never/not at all," "rarely," "sometimes," or "often." The same alternatives are used in the Impact of Event Scale, which is considered to be a good correlate to the diagnosis of PTSD (Horowitz, Wilner, & Alvarez, 1979). Statements with answers "sometimes" or "often" were counted as occurring symptoms. In the present study, criterion F was considered to be met if subjects had marked  $\geq 5$  on a scale (range 1–10), displaying how much the symptoms affected their daily life. To fulfill criterion E in DSM-IV, participants had to report a duration of symptoms for at least 1 month. In the analysis, TES data were regarded as either: (1) a sum-score of the 17 items regarding criteria B, C, and D, (2) meeting all PTSD criteria or not, or (3) meeting symptom criteria B, C, D or not. The reliability of the TES (17 symptom items) was estimated by means of Cronbach's  $\alpha (.88)$ .

The TES was developed for use in a pilot study on posttraumatic stress after childbirth but has also been used clinically among traumatized individuals, mostly among newly delivered women and victims of physical and sexual abuse. At that time there were no other instruments available resembling DSM-IV criteria. Lately, other instruments that also are based on the 17 symptoms as in DSM-IV criteria have been developed and shown to be valid and to have adequate internal consistency (e.g., Posttraumatic Stress Disorder Symptom Scale (PSS, Foa, Riggs, Dancu, & Rothbaum, 1993).

The Wijma Delivery Experience/Expectancy Questionnaire (W-DEQ) measures fear of childbirth by means of a woman's cognitive appraisal of the delivery, asking her about her expectancies before (version A) and experiences after childbirth (version B) (Wijma, Wijma, & Zar, 1998; Zar et al., 2001). This

self-assessment graphic rating scale has 33 items and six scale steps per item, ranging from “not at all” (=0) to “extremely” (=5). The sum-score varies from a minimum score of 0 to a maximum of 165. The higher the score, the more negative the appraisal of the delivery, i.e., fear of childbirth. Here, sum-scores  $\geq 85$  were considered as severe fear of childbirth according to Ryding et al. (1998b). W-DEQ data were regarded as either a sum-score or a dichotomy (W-DEQ score  $\geq 85$ ). Cronbach’s  $\alpha$  was .95 on the W-DEQ (version A).

### 2.5. Dropouts—Time 1

A random sample of 166 women in the Linköping population who did not participate in the first assessment (750 women) were compared on available data with those who did. Such data were age, parity, possible remarks of previous traumatic birth experience. No statistical differences were found ( $t = 1.16$ ,  $df = 1387$ ,  $P = .25$ ;  $\chi^2 = 2.0$ ,  $df = 1$ ,  $P = .27$ ;  $\chi^2 = .025$ ,  $df = 1$ ,  $P > .99$ , respectively). Data were assessed from medical records.

### 2.6. Dropouts—Time 2

A further analysis of external dropouts focused on the comparison of those who participated in the first assessment but dropped out from the second, and those who participated in both (Time 1 and 2).

No statistically significant differences in age, parity, civil status, earlier traumatic experiences, trait anxiety, stress coping ability and perceived social support were found between dropouts and participants in the Linköping and Kalmar populations. Dropouts had a relatively lower education than participants, both in Kalmar and Linköping ( $\chi^2 = 11.9$ ,  $df = 1$ ,  $P = .02$ ;  $\chi^2 = 12.2$ ,  $df = 1$ ,  $P = .02$ ).

Dropouts in the Kalmar and Linköping populations differed in four ways. Nonparticipants in Kalmar had more often a depressive symptomatology, self-reported experience of psychological problems, and more often experience of previous psychological/psychiatric counseling than participants ( $\chi^2 = 5.3$ ,  $df = 1$ ,  $P = .03$ ;  $\chi^2 = 4.2$ ,  $df = 1$ ,  $P = .04$ ;  $\chi^2 = 15.1$ ,  $df = 1$ ,  $P = .002$ ). Dropouts in Linköping had relatively more often experience of previous traumatic births than participants ( $\chi^2 = 4.9$ ,  $df = 1$ ,  $P = .04$ ).

### 2.7. Statistics

Since distribution of TES sum-scores was negatively skewed, sum-scores were transformed by means of the logarithm in order to make the distribution more normal. The Kolmogorov–Smirnov test did not accept the distribution of the transformed data as normal, but still we chose to use parametric methods because the sample was large and asymptotic. The sum-scores on the W-DEQ were normally distributed (Kolmogorov–Smirnov,  $P = .64$ ).

When TES- and W-DEQ data were treated as sum-scores, analysis of variance (ANOVA) was used. When treated as dichotomies (high/low) odds ratios and  $\chi^2$  tests (with Fisher's exact *P*-value) were calculated. The odds ratios were interpreted as an estimation of the relative risk.

The former analysis deals merely with the frequency of traumatic stress symptoms as a sum-score, regardless of criteria B, C, and D are met or not. The latter analysis does consider more the prevalence of traumatic stress in terms of symptom criteria according to DSM-IV (criteria B, C, and D).

### 3. Results

#### 3.1. Prevalence

As hypothesized, symptoms of traumatic stress (related to the forthcoming delivery) did occur in pregnant women in late pregnancy (Time 2). Of all subjects, 2.3% met all DSM-IV criteria for PTSD (among nulliparous 1.1% and multiparous 3.2%). Symptom criteria B, C, and D (i.e., intrusion, avoidance and numbing, and increased arousal) were met by 5.8% of the women (among nulliparous 3.2% and multiparous 7.5%). No significant differences were found between the two samples in Linköping and Kalmar (Table 2).

No significant differences regarding background variables (except gestational week) were found between the two samples in Linköping and Kalmar (Table 1). High trait anxiety and depressive symptomatology were also equally prevalent in the Linköping and Kalmar samples at Time 1 ( $\chi^2 = .4$ ,  $df = 1$ ,  $P = .56$ ;  $\chi^2 = .25$ ,  $df = 1$ ,  $P = .62$ ). Thus, no further distinctions were made between the two groups.

Severe fear of childbirth was found in 127 women (13.5%, Table 2). As hypothesized, the sum-score of traumatic stress symptoms and fear of childbirth were significantly positively correlated in late pregnant women ( $r = .61$ ,  $P < .0001$ ). In terms of relative risk, severe fear of childbirth (dichotomy) in late pregnancy was associated with a 7.6-fold ( $P < .0001$ ) risk for meeting the BCD criteria of PTSD when the data had been adjusted for depressive symptomatology, high trait anxiety, low stress coping, and low social support.

Table 2  
Distribution of women who met PTSD, BCD or severe fear of childbirth criteria

Variables	Linköping <i>n</i> (% of 502)	Kalmar <i>n</i> (% of 438)	$\chi^2$	<i>df</i>	<i>P</i>
PTSD criteria met (criteria A, B, C, D, E, F)	9 (1.8)	13 (3.0)	1.4	1	.28
BCD criteria met (criteria B, C, D)	30 (6.0)	25 (5.7)	.03	1	.89
Severe fear of childbirth (W-DEQ sum-score $\geq 85$ )	63 (12.5)	64 (14.5) <sup>a</sup>	.8	1	.39

<sup>a</sup> In a total of 440.



### 3.2. Traumatic stress symptoms and fear of childbirth as continuous variables

Background variables as previous experience of psychological/psychiatric counseling related to pregnancy/childbirth, previous traumatic birth experiences, and all psychological characteristics were related to the sum-scores of traumatic stress symptoms and to fear of childbirth (Table 3).

Table 3  
Background variables and psychological characteristics in relation to traumatic stress (BCD sum-score) and fear of childbirth (W-DEQ sum-score)

Background variables	Traumatic stress mean (S.D.)	Fear of childbirth mean (S.D.)
<i>Events</i>		
Previous counseling related to pregnancy/childbirth <sup>a</sup>	$F(1,557) = 16.2, P < .001$	$F(1,556) = 7.0, P = .008$
No	25.9 (7.4)	57.7 (23.4)
Yes	34.5 (11.3)	71.7 (26.7)
Previous traumatic experiences	$F(1,918) = 6.0, P = .01$	$F(1,919) = .17, P = .68$
No	25.5 (7.0)	59.1 (22.6)
Yes	27.8 (8.1)	61.8 (25.3)
Previous traumatic childbirth <sup>a</sup>	$F(1,557) = 4.8, P = .03$	$F(1,556) = 17.2, P < .0001$
No	26.1 (7.6)	57.3 (23.1)
Yes	30.5 (9.2)	74.5 (27.3)
Parity	$F(1,918) = .3, P = .57$	$F(1,919) = 6.1, P = .01$
Nulliparous	25.7 (6.7)	62.1 (22.7)
Parous	26.4 (7.8)	58.4 (23.8)
Self-reported previous psychological problems	$F(1,918) = 40.1, P < .0001$	$F(1,919) = 19.3, P < .0001$
No	24.9 (6.6)	57.4 (22.3)
Yes	28.7 (8.3)	65.1 (24.9)
<i>Psychological characteristics</i>		
Trait anxiety	$F(1,928) = 61.9, P < .0001$	$F(1,929) = 36.6, P < .0001$
Low	24.3 (6.0)	55.4 (22.1)
High	31.3 (8.6)	73.0 (21.7)
Depressive symptomatology	$F(1,928) = 24.4, P < .0001$	$F(1,929) = 6.7, P = .01$
No	25.5 (6.8)	58.8 (22.6)
Yes	37.5 (9.1)	83.4 (24.1)
Stress coping	$F(1,928) = 9.4, P = .002$	$F(1,929) = 5.5, P = .02$
Low	30.2 (8.8)	70.3 (23.8)
High	24.9 (6.4)	56.9 (22.2)
Social support	$F(1,928) = 8.3, P = .004$	$F(1,929) = 12.5, P < .001$
Low	29.7 (8.5)	70.4 (23.8)
High	25.0 (6.7)	56.9 (22.2)

<sup>a</sup> Only parous women included.

Table 4

Odds ratios of meeting BCD symptom criteria of PTSD and severe fear of childbirth

Background variables	Criteria B, C, D fulfilled		Severe fear of childbirth	
	OR (95% CI) <sup>a</sup>	P	OR (95% CI) <sup>a</sup>	P
<i>Events</i>				
Psychological counseling related to pregnancy/childbirth	3.8 (1.5–9.3)	.004	2.4 (1.1–5.2)	.04
Traumatic experiences	1.0 (.5–1.9)	.99	.97 (.60–1.6)	.91
Previous traumatic childbirth	1.4 (.4–4.5)	.62	4.0 (1.7–9.3)	.001
Multiparity	2.3 (1.2–4.4)	.02	.96 (.64–1.4)	.85
Self-reported previous psychological problems	2.4 (1.3–4.4)	.003	1.7 (1.1–2.5)	.01
<i>Psychological characteristics</i>				
High trait anxiety	5.0 (2.4–10.5)	.0001	2.3 (1.5–3.8)	.0004
Depressive symptomatology	3.5 (1.6–7.8)	.002	1.8 (.90–3.6)	.10
Low stress coping	1.8 (.9–3.5)	.08	1.8 (1.1–2.8)	.01
Low perceived social support	1.0 (.5–1.9)	.91	1.8 (1.2–2.9)	.008

<sup>a</sup> Odds ratio, controlling for confounding effects of variables within each category of events and psychological characteristics.

### 3.3. Traumatic stress symptoms and fear of childbirth as dichotomous variables

In an analysis of traumatic stress symptoms as a dichotomy (meeting criteria B, C, and D or not), relative risk estimations showed five variables that were significantly associated with an increased risk of meeting the BCD symptom criteria of PTSD in late pregnancy (Table 4).

Experience of psychological/psychiatric counseling related to pregnancy/childbirth, previous traumatic childbirth, previous psychological problems, and all psychological characteristics but depressive symptomatology turned out to be significant risk factors for severe fear of childbirth (Table 4).

### 3.4. Additional analysis

Prevalence of depressive symptomatology ( $\geq 9$  on the BDI, 14-item version) in early pregnancy was 5.7% (70/1224 women).

Table 5

Depressive symptomatology, trait anxiety (STAI) at Time 1 in relation to symptom criteria BCD at Time 2

Depressive symptomatology	BCD criteria not met ( $n = 886$ )		BCD criteria met ( $n = 55$ )	
	STAI–	STAI+	STAI–	STAI+
Low	681	175	15	24
High	0	29	0	16

Furthermore, subjects with high trait anxiety more frequently showed a depressive symptomatology than subjects with low trait anxiety did ( $\chi^2 = 190.1$ ,  $df = 1$ ,  $P < .0001$ ). This was true also when the sample was divided into those who met BCD criteria and those who did not ( $\chi^2 = 8.5$ ,  $df = 1$ ,  $P < .01$ ;  $\chi^2 = 99.6$ ,  $df = 1$ ,  $P < .001$ , [Table 5](#)).

## 4. Discussion

### 4.1. Dropouts

This study was quite extensive and focused on present and previous psychological problems. Therefore, some women might have found the questions to be too provocative in terms of evoked psychological distress. The dropout pattern in studies of psychological variables is well-known. Previous research has found that there is a positive relation between psychological difficulties and dropout rates ([Andrykowski, Cordova, McGrath, Sloan, & Kenady, 2000](#); [DiMatteo, Lepper, & Croghan, 2000](#); [Steel et al., 2000](#)). Thus, it can be assumed that rates of traumatic stress in our study are more likely to be underestimated than the opposite. Unfortunately, our analysis of psychological problems among the women who chose not to participate did not offer substantial information, probably because the medical records do not seem to be reliable regarding reports on such data.

### 4.2. Traumatic stress during pregnancy

Our data show occurrence of “pre”traumatic stress (i.e., symptoms of traumatic stress that are related to a threatening forthcoming event), and thus represent a specific form of anticipatory anxiety. These findings are in concordance with those of [Kiser et al.](#), who documented PTSD-like reactions that were related to the prediction of an earthquake that in fact never happened ([Kiser et al., 1993](#)). Therefore, our findings question the way DSM-IV limits occurrence of these symptoms to the aftermath of traumatic events.

Existence of “pre”traumatic stress is theoretically important, since DSM-IV states that traumatic stress develops after a traumatic experience, not before. [Ehlers and Clark’s](#) proposed cognitive model of posttraumatic stress disorder accentuates that anxiety generally is seen as a result of appraisals of an impending threat, while in PTSD, the problem is the memory of an event that has already happened ([Ehlers & Clark, 2000](#)). Situations like an earthquake warning or a forthcoming delivery involve a potential threat as far as the individual subjectively appraises the impact of the event as threatening. Thus, these situations would fit in the traditional theoretical framework of anxiety, i.e., feelings of an impending threat.

As some researchers have pointed out, posttraumatic reactions tend to be strongly related to the intensity and severity of one’s personal appraisal ([Barlow,](#)

1988; Dunmore, Clark, & Ehlers, 1999; Jeavons, Greenwood, & Horne, 2000; Karlehagen et al., 1993). During pregnancy, fear of the delivery (e.g., appraisal of a forthcoming threatening delivery) may be present for months before the childbirth. Thus, if the appraisal of an event is a powerful predictor of posttraumatic stress, it would as well make “pre”traumatic stress possible to occur. In other words, the content of the appraisal is as important as the event itself for the development of traumatic stress reactions, both before as well as after a traumatic event.

#### 4.3. Predictors of “pre”traumatic stress

There are fundamental differences that need to be kept in mind regarding the analysis of “pre”traumatic stress as a dichotomy and as a continuum. In the analysis of the dichotomy, the variance is minimized. Also, in order to meet the criteria of intrusive thoughts, avoidance and numbing, and arousal (criteria B, C, and D), subjects need to show one, three, and two symptoms, respectively in each category. However, when using the sum-score, it does not matter in which category the symptoms occur.

The risk factors for “pre”traumatic stress were mainly the same in the analysis of “pre”traumatic stress as a dichotomy and as a continuum. These were: previous psychological/psychiatric counseling related to childbirth, self-reported previous psychological problems, high trait anxiety, and depressive symptomatology. Our findings are in accordance with previous studies of posttraumatic stress after childbirth as well as after other events (Czarnocka & Slade, 2000; Joy, Probert, Bisson, & Shepherd, 2000; McFarlane, 1988). In a study of PTSD in patients with burns, Yu and Dimsdale found preburn affective disorder to increase risk for PTSD (Yu & Dimsdale, 1999). Czarnocka and Slade reported that trait anxiety 72 h after the delivery was related to symptoms of traumatic stress 6 weeks postpartum (Czarnocka & Slade, 2000). Also, personal vulnerability factors, such as previous mental health difficulties, were related to posttraumatic stress symptoms, as well as being relevant predictors for depression and anxiety in general (Czarnocka & Slade, 2000). Similarly, in a study of PTSD after motor vehicle accidents, Blanchard et al. found that a pretrauma history of depression predicted the development of PTSD (Blanchard et al., 1996).

Multiparity was found to be a risk factor for meeting criteria B, C, and D of PTSD (dichotomy), but not for “pre”traumatic stress as a sum-score. This can be compared to a previous study of PTSD after childbirth, where we found that multiparous women with a PTSD symptom profile showed more fear of childbirth than primiparous women with a PTSD symptom profile (Wijma et al., 1997). Possibly, multiparous women with a previous negative birth experience become even more fearful and vulnerable during their next pregnancy, and therefore run a higher risk to develop traumatic stress in pregnancy.

Variables that predicted only “pre”traumatic stress as a sum-score, but not as a dichotomy were: previous traumatic experiences in general, previous traumatic

births, low stress coping, and low perceived social support. Possibly, one can view these variables as related to an increase in “pre”traumatic stress but not enough to alone meet B, C, and D criteria of PTSD.

#### 4.4. *Predictors of fear of childbirth*

Severe fear of childbirth in late pregnancy was found in 127 women (13.5%) and was associated to previous experience of psychological/psychiatric counseling related to childbirth, previous traumatic births, previous psychological/psychiatric problems, high trait anxiety, low stress coping ability, and low perceived social support, in early pregnancy. Similar relations were also found in the analysis of the continuous variable. The only differences in the two analyses were that depressive symptomatology and parity were not found to be risk factors for severe fear of childbirth, but were significantly related to fear of childbirth as a sum-score. These differences are possibly caused by the loss of variance when using a dichotomous variable, as previously seen in the analysis of “pre”traumatic stress.

Few studies have been carried out on predictors of fear of childbirth. In a cohort study, Areskog et al. found that women with fear of childbirth had more negative life experiences than those without such fear (Areskog, Uddenberg, & Kjessler, 1983). Preferably, background variables should be collected even before pregnancy since pregnancy itself triggers psychological reactions.

#### 4.5. *Depressive symptomatology*

Prevalence of depressive symptomatology on 5.7% (70/1224) in early pregnancy is lower than other studies. Gotlib reported a prevalence on 10%, also using BDI (cut-off score  $\geq 10$  on the full version), while Da Costa found 25% of their population to have elevated depressive symptomatology, using the Lubin Depression Adjective Checklist (Da Costa, Larouche, Dritsa, & Brender, 2000; Gotlib, Whiffen, Mount, Milne, & Cordy, 1989). Partly, the higher prevalence in other studies has been caused by the overlap between common somatic symptoms during pregnancy and depressive symptomatology (Affonso, Anindya, Horowitz, & Mayberry, 2000) and different cut-offs. The BDI does include such items while the Lubin Depression Adjective Checklist does not. Thus, we only included the results of item 1–14 in the BDI.

In an additional analysis we studied the relation between depressive symptomatology and high trait anxiety. Interestingly, depressive symptomatology never occurred without anxiety, but anxiety did occur without depressive symptomatology. As for pregnant women, this finding is in accordance with previous studies (Da Costa et al., 2000). What really surprised us was the strength of the relation between depressive symptomatology and trait anxiety (i.e., there was not a single woman who met our criteria for depressive symptomatology and at the same time did not have high trait anxiety).

Depressive symptomatology and trait anxiety were assessed on the same occasion (early pregnancy), which makes it impossible to draw any conclusions whether the relation is causal or not. But since trait anxiety was found to exist in the absence of depressive symptomatology and not the other way around, one could suspect that anxiety predicts depressive symptomatology. Similar results were presented by Da Costa, who also found that women who were depressed postpartum had higher scores on anxiety measures during pregnancy (Da Costa et al., 2000). Thus, anxiety seems to be a necessary condition for depression. Such reasoning makes sense, i.e., anxious people, who feel that nothing can help them to recover from their anxiety, are more likely to subsequently enter a state of depression.

Something that also might have affected the relation between depressive symptomatology and anxiety is how they are dichotomized. The BDI sum-scores were dichotomized on the basis of clinical cut-off scores (Beck & Beamesderfer, 1974) whereas trait anxiety was dichotomized at the top 25% of the STAI scores. Thus, the criterion for depressive symptomatology was much stricter than the criterion for high trait anxiety.

#### 4.6. Conclusions

This study has shown that symptoms of traumatic stress can occur before an event that is perceived as threatening or feared (i.e., that “pre”traumatic stress exists). This is noteworthy, since these symptoms traditionally only have been studied and identified in the aftermath of traumatic events.

Furthermore, symptoms of “pre”traumatic stress and fear of childbirth among pregnant women should be considered. Special attention should be paid to women who show signs of depression and high levels of trait anxiety and report psychological problems, and to those who previously have experienced psychological/psychiatric counseling related to pregnancy or childbirth.

#### Acknowledgments

This study was supported by research grants from the Health Research Council in the South-East Sweden (FORSS) and the Swedish Foundation for Health Care Sciences and Allergy Research (Vårdalstiftelsen).

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