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Preventing post-traumatic stress disorder following childbirth and traumatic birth experiences: a systematic review

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Abstract

Introduction. Between 9 and 44% of women experience giving birth as traumatic, and 3% of women develop a post-traumatic stress disorder following childbirth. Knowledge on risk factors is abundant, but studies on treatment are limited. This study aimed to present an overview of means to prevent traumatic birth experiences and childbirth-related post-traumatic stress disorder. *Material and methods.* Major databases [Cochrane; Embase; PsycINFO; PubMed (Medline)] were searched using combinations of the key words and their synonyms. *Results.* After screening titles and abstracts and reading 135 full-text articles, 13 studies were included. All evaluated secondary prevention, and none primary prevention. Interventions included debriefing, structured psychological interventions, expressive writing interventions, encouraging skin-to-skin contact with healthy newborns immediately postpartum and holding or seeing the newborn after stillbirth. The large heterogeneity of study characteristics precluded pooling of data. The writing interventions to express feelings appeared to be effective in prevention. A psychological intervention including elements of exposure and psycho-education seemed to lead to fewer post-traumatic stress disorder symptoms in women who delivered via emergency cesarean section. *Conclusions.* No research has been done on primary prevention of traumatic childbirth. Research on secondary prevention of traumatic childbirth and post-traumatic stress disorder following delivery provides insufficient evidence that the described interventions are effective in unselected groups of women. In certain subgroups, results are inhomogeneous.

Abbreviations: CI, confidence interval; CISD, critical incident stress debriefing; DSM, Diagnostic and Statistical Manual; DTS, Davidson Trauma Scale; IES (-R), Impact of Event Scale (-revised); MINI-PTSD, Mini International Neuropsychiatric Interview for PTSD; NICU, Neonatal Intensive Care Unit; PPQ, Perinatal Post-Traumatic Stress Disorder Questionnaire; PTSD, post-traumatic stress disorder; RCT, randomized controlled trial.

Introduction

The existence of post-traumatic stress disorder (PTSD) and PTSD symptoms following childbirth remained unrecognized for a long time by many professionals, perhaps because of the common belief in society that childbirth is and should be a positive experience. Since the 1990s, there has been growing focus on traumatic birth experiences and childbirth-related PTSD. Many of these

Key message

To date, no research has been carried out on how to prevent a traumatic childbirth. Several interventions have been reviewed for the prevention of post-traumatic stress disorder following childbirth; however, only expressive writing exercises immediately postpartum proved convincingly effective.

studies have focused on the prevalence, clinical consequences, etiological factors and predictors, but studies on treatment and prevention are scarce (1).

PTSD is categorized as a trauma and stress-related disorder in Diagnostic and Statistical Manual (DSM)-5. To qualify for the diagnosis, a person must have been exposed directly or indirectly to, or have witnessed, death, threatened death, actual or threatened serious injury or sexual violence. This traumatic experience should have led to a variety of symptoms (re-experiencing, avoidance, negative cognition and mood, and hyperarousal) and these symptoms should exist for at least 1 month before the diagnosis of PTSD can be made (2). PTSD symptoms (following childbirth or any traumatic event) can develop directly after the traumatic event, but can also occur much later in life (3). The diagnosis is made by a qualified professional, preferably using a validated clinical interview such as Clinician-Administered PTSD Scale (considered the gold standard) (4) or Structured Clinical Interview for DSM disorders (5). Screening questionnaires such as the Impact of Event Scale (IES) (6) and Mini International Neuropsychiatric Interview for PTSD (MINI-PTSD) (7), are useful to assess the presence of PTSD symptoms but are not suitable for diagnosing PTSD.

The percentage of women who experience delivery as traumatic is estimated at 9–44% (8–14). Of this group, a minority will develop PTSD. A recent meta-analysis reported a prevalence of symptoms of PTSD following childbirth of 3.1% in unselected populations, based on screening questionnaires, and estimates the prevalence at 15.7% in high-risk groups (15).

According to a recent systematic review, risk factors for traumatic birth experience and/or developing PTSD symptoms include a history of psychopathology, pregnancy-related pathology, operative births and several types of negative feelings concerning birth (16).

When women evaluate their delivery, four factors predominate in the rating of this birth experience: the availability of support from caregivers, the quality of relationships with caregivers, being involved in decision-making, and having high expectations or having experiences that exceed expectations (17).

General consequences of a traumatic birth experience vary from feelings of low self-esteem to difficulty breastfeeding and problems with sexuality (14,18–27), to the wish for an elective cesarean section in a subsequent pregnancy (28) and fear of childbirth (18). Very recently, a systematic review was published on the effect of perinatal PTSD symptoms on child outcomes (29). The authors conclude that maternal PTSD leads to a lower birthweight and lower rates of breastfeeding. Outcomes such as child development, mother–infant interaction and preterm birth seem to be less clearly associated with PTSD because the included studies are contradictory.

Given the substantial proportion of women who have a traumatic birth experience, some of whom develop PTSD or PTSD symptoms, as well as the clinical consequences that arise from these situations for both mother and child, interventions to prevent traumatic childbirth experiences and postpartum PTSD are of great value. Although experts in the field first mentioned this problem in 2008, saying that future studies should focus at the prevention of PTSD following childbirth (30), an overview of potential strategies has not yet been published.

The main goal of this paper was to review all the available knowledge on existing interventions that may prevent a traumatic birth experience, PTSD and PTSD symptoms following childbirth, and to answer two research questions:

1. What are the effects of actions and interventions before and during labor aimed at preventing traumatic birth experiences in pregnant women? (*Primary prevention*)
2. What are the effects of actions and interventions aimed at preventing PTSD or PTSD symptoms following childbirth in women who have recently given birth and have a (high risk of developing) traumatic birth experience? (*Secondary prevention*).

Material and methods

Major databases [Cochrane; Embase; PsycINFO; PubMed (Medline)] were searched for studies in English and Dutch published between 1950 and December 2016, using all possible combinations of the following search terms: birth, postpartum, post-traumatic stress disorder, trauma and prevention (see Table 1). Studies were considered for inclusion if they were quantitative and if the women were assessed up to a maximum of 1 month after birth (due to DSM timing criteria and the preventive character of this review). Articles were included if they focused on pregnant women or women who had recently given birth and on those with PTSD or PTSD symptoms or a high risk of developing either, after childbirth.

The original papers of reviews and systematic reviews were extracted to evaluate individual studies. The reference lists of the retrieved articles were also used to supplement the search. After reading titles and abstracts, possibly useful articles were read in full. Two reviewers (L.F.G. C.A.I.S.) independently reviewed these studies in more depth for final inclusion. A third independent reviewer (M.G.v P.) was available for a decisive opinion in case the two reviewers disagreed.

Table 1. Overview of search strategies.

Databases	Medline (PubMed), EMBASE, PsycINFO, Cochrane	
Period	1950 to present	
Languages	English, Dutch	
Date	December 2016	
DATABASE	Total	2550
Medline (PubMed)	[("Stress Disorders, Post-Traumatic"[Mesh] OR "stress disorder"[Tiab] OR post-traumatic[Tiab] OR post-traumatic[Tiab] OR "ptsd"[Tiab] OR traumatic[Tiab] OR "psycho trauma"[Tiab] OR psychotrauma[Tiab] OR "traumatic stress"[Tiab] OR "stress response"[Tiab]) AND ("Postpartum Period"[Mesh] OR "postpartum"[Tiab] OR postnatal[Tiab] OR "Peripartum Period"[Mesh] OR "peripartum"[Tiab] OR perinatal[Tiab] OR "delivery"[Tiab] OR "obstetric"[Tiab] OR "obstetrics"[Tiab] OR "parturition"[Tiab] OR "childbirth"[Tiab] OR "birth"[Tiab] OR "Labor, Obstetric"[Mesh] OR "labor"[Tiab] OR "labor"[Tiab])) AND (prevent* OR "risk factor" OR "risk factors" OR "risk group" OR "risk groups") AND ((Dutch[lang] OR English[lang])]	1060
Embase	[(Stress Disorders, Post-Traumatic OR stress disorder OR post-traumatic OR post-traumatic OR ptsd OR traumatic	979
PsycINFO	OR psycho trauma OR psychotrauma OR traumatic stress OR stress response) AND (Postpartum Period OR postpartum OR postnatal OR Peripartum Period OR peripartum OR perinatal OR delivery OR obstetric OR obstetrics OR parturition OR childbirth OR birth OR Labor, Obstetric OR labor OR labor) AND (prevent* OR risk factor OR risk factors OR risk group OR risk groups)]	508
Cochrane	No search terms, manual search within topics "pregnancy & childbirth", "mental health", "gynecology"	3

The level of evidence of each included article was evaluated using GRADE (Grading Recommendations Assessments, Development and Evaluation) methods and by evaluating the level of bias (see Table 2).

Results

A total of 1719 unique articles were retrieved. After reading titles and abstracts, 135 possibly useful articles were read in full. Five articles were found through manual search while reading the identified papers. A total of 13 relevant original articles were finally included. A flow chart for the selection of articles is presented in Figure 1.

All 13 included articles investigated secondary prevention. No relevant articles were found concerning the question on primary prevention.

Of the 13 included articles, 12 were randomized controlled trials (31–42) and one was a case control study (43; see Table S1 for levels of evidence and details of each study).

The interventions were debriefing (31,32,34,37), encouraging skin-to-skin contact and immediate breastfeeding postpartum (39), encouraging mothers of a stillborn baby to see and hold the baby (43), expressive writing tasks (41,42) and several different structured psychological interventions (31,33–36,38).

Four studies examined an unselected (healthy) population (31,34,41,42) and two studies included women with a traumatic or distressing birthing experience (32,39). The other studies focused on specific groups, such as women who had a stillbirth (43), who had a non-spontaneous vaginal delivery (i.e. using vacuum or forceps) (35)

Table 2. Risk of bias.

Study	Selection bias	Performance bias	Detection bias	Attritition bias	Reporting bias	Confounding bias	GRADE score
Priest (34)	–	+	–	?	+	?	MODERATE
Selkirk (31)	–	+	?	+	–	+	LOW
Gamble (32)	–	+	–	–	–	–	HIGH
Abdollahpour (39)	+	+	–	+	–	+	LOW
Kershaw (37)	+	+	?	+	+	+	VERY LOW
Ryding (36)	+	+	+	?	–	–	LOW
Borghini (40)	–	+	?	–	+	+	LOW
Jotzo (33)	?	+	+	–	–	–	MODERATE
Zelkowitz (35)	–	+	–	+	–	–	MODERATE
Shaw (38)	–	+	?	+	–	–	MODERATE
Di Blasio (42)	?	–	?	+	–	–	MODERATE
Di Blasio (41)	?	+	?	+	–	–	LOW
Hughes (43)	+	+	?	+	–	+	VERY LOW

–, low risk of bias; **+**, high risk of bias; ?, unclear risk of bias.

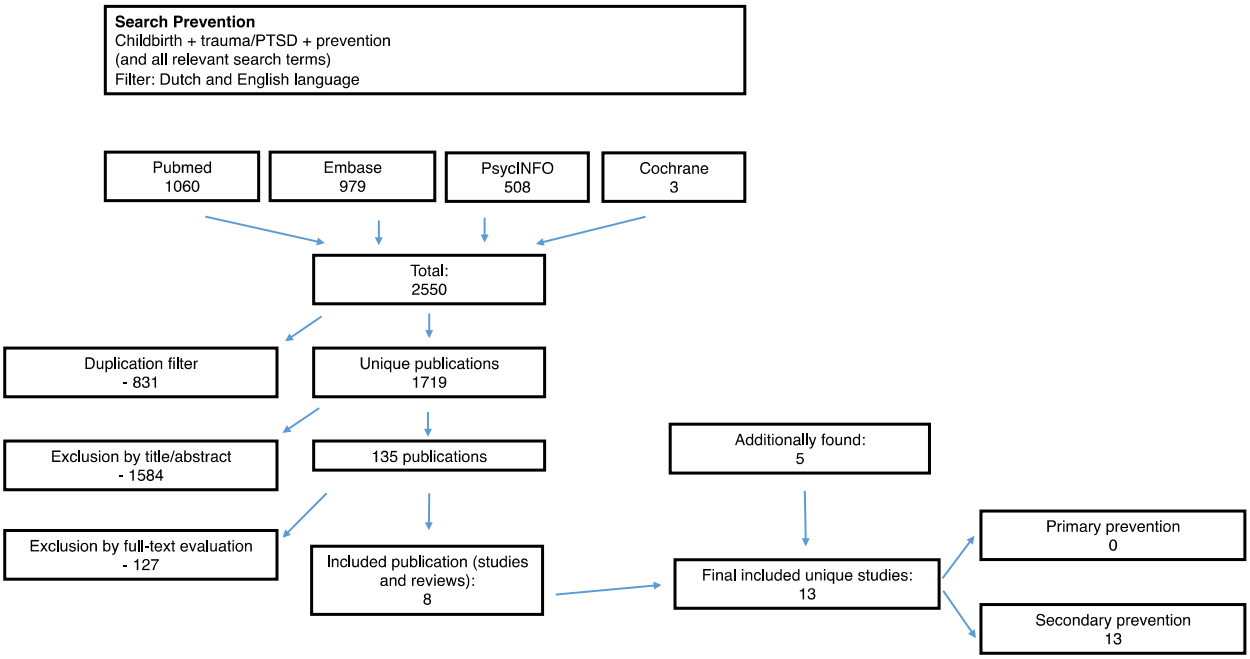

Figure 1. Flowchart search. [Color figure can be viewed at wileyonlinelibrary.com].

and/or an emergency cesarean section (36,37) and mothers of premature babies that were (33) or were not (35,38,40) admitted to the Neonatal Intensive Care Unit (NICU).

PTSD symptoms were measured by means of IES(-R) (29,31,32,34,35,37), MINI-PTSD (32), PTSD-1 interview (43), Perinatal Post-traumatic Stress Disorder Questionnaire (PPQ) (35,40–42) and the Davidson Trauma Scale (DTS) (38). These screenings tools are self-report measures to investigate such PTSD symptoms as hyperarousal, intrusion and avoidance.

In the next part of this review, an overview is given of the results per study and arranged per outcome. The primary outcome is "PTSD diagnosis." Because it is clinically also relevant to investigate preventive interventions on symptoms of PTSD, the presence or severity of these symptoms was chosen as a secondary outcome variable.

Interventions for secondary prevention

PTSD diagnosis (primary outcome) – debriefing. Two randomized controlled trials (RCTs) studied the effect of debriefing on women who met the criteria for a PTSD diagnosis (32,34). A meta-analysis was not performed because the two studies were too heterogeneous. Besides, this was not considered of added value, since both studies had similar outcomes.

Priest et al. evaluated the effects of critical incident stress debriefing (CISD) after childbirth in 1745 women who had delivered healthy term infants (34). Standard postpartum care (n = 870) was compared with individual, standardized debriefing sessions based on CISD methods (n = 875), carried out within 72 h after labor. At 2, 6 and 12 months postpartum, both groups were assessed on whether they met PTSD criteria based on DSM-IV. No difference was found between these groups in the proportion of women who met diagnostic criteria for PTSD in the year after birth: intervention 0.6% vs. control 0.8%, relative risk (RR) 0.71, 95% (confidence interval (CI) 0.23–2.23 (p = 0.58).

In Gambles RCT, 103 women were included who had experienced the birth as traumatic ("trauma" defined according to criterion A of DSM-IV) (32). Fifty women received a face-to-face meeting (incorporating elements of CISD) with a research midwife within 72 h postpartum and again a counseling session by telephone four to 6 weeks after the delivery. The other women received standard postpartum care. The intervention did not lead to fewer women meeting the criteria for PTSD diagnosis (using MINI-PTSD) when compared with standard postpartum care measured at four to 6 weeks postpartum [χ^2 0.236, p = 0.392].

PTSD symptoms (secondary outcome) – debriefing. Four studies assessed the effect of debriefing on the severity of PTSD symptoms (31,32,34,37). One study found a significant difference in favor of debriefing at certain assessment points (32), whereas the other three did not (31,34,37).

Priest et al. found that there were no significant differences between the intervention and control group in scores on IES at 2, 6 or 12 months postpartum (no exact values given) (34).

In the previously mentioned RCT of Gamble, the author assessed the number of women diagnosed with PTSD and measured the severity of PTSD symptoms with the MINI-PTSD (32). Four to 6 weeks postpartum, the intervention group did not have fewer PTSD symptoms (mean 4.81, SD 3.65) than the control group (mean 5.45, SD 3.01) (not significant). However, three to 6 months postpartum, the intervention group experienced significantly fewer PTSD symptoms (mean 2.54, SD 2.44) than the control group (mean 3.83, SD 3.59) ($p = 0.035$).

In Selkirk's randomized controlled trial (31), 149 women who had recently delivered were randomized into an intervention group (a single midwife-led debriefing session) and a control group (no debriefing); PTSD symptoms were measured at one and 3 months postpartum with the IES. There were no significant differences between the groups in PTSD symptom severity at either assessment point ($p = 0.14$).

The effect of a midwife-led, sixfold postpartum debriefing therapy (following CISD criteria) compared with standard postpartum care was also evaluated in an RCT by Kershaw (37). All women included ($n = 319$) had delivered their child by operative delivery (unplanned cesarean section, vacuum extraction or forceps). In that study, an IES score >19 was considered clinically significant. There were no significant differences in incidence of post-traumatic stress 10 days postpartum (intervention group: mean = 16.9; control group: mean = 20.19; $p = 0.27$) or 10 weeks postpartum (intervention group mean = 12.72; control group, mean = 15.97; $p = 0.09$).

Encouragement of skin-to-skin contact and direct breastfeeding postpartum. In Abdollahpour's RCT, women who gave birth to healthy term babies were asked immediately postpartum if they had experienced the birth as traumatic (39). If this was the case, they were included in the study. Half of the 84 included women were exposed to an intervention based on the nine stages of "the magical first hour" and the other half received standard postpartum care. The "magical hour" is a period of time (1.5–2 h after birth) in which nine stages occur, including crying, relaxation and awakening of the baby, crawling on the breast and suckling stage (see Table S1 for a description of all stages). In the intervention group, women experienced fewer PTSD symptoms (measured by IES-R) than in the control group at 2 weeks postpartum (22.6 ± 8.6 vs. 27.8 ± 9.7, $p = 0.01$) and 3 months postpartum (9 ± 4 vs. 14.6 ± 7.8, $p = 0.001$), but not four to 6 weeks postpartum (18.6 ± 6 vs. 20.6 ± 10.0, $p = 0.36$). In a subgroup analysis, Abdollahpour showed that the percentage of women suffering moderate to severe PTSD symptoms did not differ significantly between the intervention and the control group.

Structured psychological interventions. Five studies examined the effects of various psychological interventions (33,35,36,38,40). Due to heterogeneity between the different types of interventions, a meta-analysis could not be performed.

Borghini included 60 mothers of extremely premature babies (defined as "< 33 weeks of gestation") (40). He exposed 30 of these women to a psychological intervention based on system therapy, compared with standard postpartum care at three time points (33 weeks post-conception, 42 weeks post-conception, and 4 months past the corrected age (meaning "4 months after the theoretical term of 40 weeks after conception") and included an observation and evaluation of the delivery. At 12 months post conception, no significant difference was found between the intervention and control group in severity of PTSD symptoms, measured with PPQ ($p = 0.07$).

In Jotzo's RCT, 50 women who had given birth prematurely and whose child was admitted to the NICU were included (33). A structured psychological intervention combining crisis intervention and psychological first aid was applied within 5 days postpartum and compared with standard postpartum care. PTSD symptoms were measured using IES. At the time of their infant's discharge, the intervention group had significantly lower levels of PTSD symptoms (mean 25.2, SD 13.9) than the control group (mean 37.5, SD 19.2) ($p = 0.013$).

The Cues program, a six-session psychological program assessed by Zelkowitz et al. (35), started when the infant was admitted to the NICU and lasted until 2–4 weeks after discharge (when the infant's corrected age was six to 8 weeks). The Cues sessions taught mothers, among other things, to recognize signs of anxiety and distress and to alleviate their distress. Measurements using the PPQ showed no significant differences in PTSD symptoms between the intervention group (mean 2.9, SD 2.9) and the control group (mean 3.2, SD 2.8) (95% CI–0.8 to 1.5, $p = 0.54$).

Shaw et al. found that a psychological intervention led to significantly fewer maternal PTSD symptoms at 1 month (effect size −0.333, $p = 0.041$) and 6 months post-intervention (effect size –0.741, $p < 0.001$), using the DTS, in mothers who had developed symptoms related to their infant's preterm birth and NICU hospitalization (38). These women did not meet the full criteria for PTSD at the time of entry. The intervention included elements of trauma-focused cognitive behavioral therapy.

Ryding et al. also investigated the effects of postpartum counseling on the severity of PTSD symptoms measured by the IES at one and 6 months postpartum (36). In that study, counseling sessions were repeated three to four times in the postpartum weeks in 50 women who had gone through an emergency cesarean section. Counseling included a semi-structured interview concerning the delivery experience and emotions around it. The control group ($n = 49$) was given standard care. The intervention led to significantly fewer PTSD symptoms compared with the control group at 1 month postpartum (mean 3.0, SD 1.0–11.0 vs. mean 7.5, SD 4.0–15.0) ($p = 0.01$) and 6 months postpartum (mean 4.0, SD 1.0–9.0 vs. mean 8.5, SD 3.0–16.0) ($p < 0.05$).

Expressive writing. Di Blasio investigated the effect of expressive writing on PTSD symptoms in two studies (41,42). One of these studies showed that expressive writing immediately postpartum has a significantly positive effect on PTSD symptoms.

The evaluated intervention consisted of 20 min of expressive writing according to Pennebaker's method (1988), noting down thoughts, expectations and emotions related to the delivery. This was compared with a control group of women who had to write about their daily activities in behavioral terms, not emotional ones.

The first study included 176 women in the third trimester of their pregnancy who gave birth to a healthy baby without severe perinatal complications (42). The writing task was done 2 days postpartum, and PTSD symptoms were evaluated with the PPQ. PTSD symptoms did not differ between both groups at 4 days postpartum ($\beta = -0.09$, not significant), but they did after 3 months ($\beta = -0.28$, $p < 0.01$).

In the second study, 113 women were included after they had delivered a healthy baby (41). Three days postpartum the same writing task as mentioned above was performed. At 3 months postpartum, 10.5% of women in the intervention group vs. 30% in the control group (no *p*-values given) had possible clinical PTSD with more than six symptoms. Women in the intervention group showed a significantly greater decrease at 3 months postpartum than at 3 days postpartum of PTSD symptoms than in the control group ($p < 0.003$).

Seeing and holding stillborn infant, having a funeral and keeping mementoes. A case-control study by Hughes et al. investigated whether specific behaviors that promote contact with a stillborn infant affected the presence or absence of PTSD symptoms during a subsequent pregnancy (43). Based on PTSD-1 interviews, women who had seen their stillborn infant had stronger symptoms of PTSD (mean 40.6, SD 14.7) than those who had not (mean 28.3, SD 10.6) (95% CI 1.8–22.7, $p = 0.02$), and the same applied to women who had held their stillborn (mean 43.2, SD 14.9) compared with those who had not (mean 30.1, SD 10.2) (95% CI 5.1–21.2, $p = 0.002$).

In conclusion, the majority of the evidence shows that debriefing is not effective for the prevention of PTSD (32,34) or PTSD symptoms (29,32,35). Three studies found that structured psychological interventions had a significant positive effect on PTSD symptoms (31,34,36), whereas two did not (35,40). Writing tasks postpartum seem to have a positive effect on PTSD symptoms 3 months postpartum (41,42). Finally, holding or seeing a stillbirth appeared to increase the risk of PTSD symptoms during a subsequent pregnancy (43), and skin-to-skin contact immediately postpartum with a healthy infant seemed to have a preventive effect on PTSD symptoms (39); however, the level of evidence of the last two studies was very low, among others reasons because of the retrospective study character (43), a limited amount of study participants and several other types of bias (see Table 2).

Discussion

The aim of this review was to provide an overview of current knowledge on effective ways to prevent a traumatic birth experience and postpartum PTSD or PTSD symptoms. We found no research on the effects of primary prevention of traumatic birth experience and 13 papers evaluating the effects of secondary prevention interventions regarding PTSD and PTSD symptoms following childbirth. Overall, current research shows that interventions to prevent PTSD or PTSD symptoms in an unselected group of postpartum women have not been proven effective, with the exception of expressive writing tasks (41,42). Inconclusive results were found in selected groups, such as women who gave birth to premature babies who were or were not admitted to the NICU, or women with a traumatic birth experience.

Although no studies specifically evaluated the effects of interventions to prevent traumatic birth experiences, multiple studies have focused on negative birth experiences. Recently, a Cochrane review summarized the results of 22 studies (including a total of 15 288 women) on the effects of continuous support during labor on several outcomes, among others "negative rating/feelings about the birth experience" (44). The support was provided by hospital staff, by women who were not hospital employees and had no personal relationship with the laboring women (such as doulas) or by chosen members from the women' own social networks. Continuous support during delivery was found to have a significantly positive effect on the birth experience. Further research will have to clarify

which specific types of intervention or aspects of continuous support are effective in preventing a traumatic birth experience, but more direct support and attention to birthing women and their experience of birth could perhaps be one of them. A forthcoming study (45) shows that women attribute their traumatic childbirth experience to a lack or loss of control, to suboptimal communication with health practitioners, and to too little practical and emotional support. Consequently, awareness of these factors among health practitioners could lead to a different role during labor and consequently to fewer traumatic events.

Several studies were found aimed at preventing PTSD or PTSD symptoms following childbirth. In an unselected population, CISD did not lead to fewer cases of PTSD or fewer PTSD symptoms (31,34), nor did debriefing in women who had undergone emergency cesarean section, vacuum extraction or forceps delivery (37). One study found that in a selected group of women who had had a traumatic birth experience or were at risk or at high risk of experiencing one, debriefing with or without aspects of CISD did lead to fewer PTSD symptoms 3 months postpartum (32,36).

It remains unclear whether structured psychological interventions for mothers of premature babies admitted to NICU lead to fewer PTSD symptoms, as two studies found an effect (33,38) but one study did not (35), and all three studies were of moderate evidence level. Another study found that seeing or holding a stillbirth leads to more PTSD symptoms than not seeing or holding (43), although the level of evidence is very low. The same is the case for the study that investigated skin-to-skin contact with a healthy newborn immediately postpartum, although this intervention led to fewer PTSD symptoms. In most studies, irrespective of the effect of debriefing or structured psychological interventions on PTSD symptoms, women did experience the intervention as positive (31,32,34). This was not specifically mentioned in the studies that investigated the effect of holding or seeing a stillborn baby and the effect of "the magical hour" (39,43).

There was a great heterogeneity between all included studies in type of study participants, intervention, timing of assessment, use of questionnaires, and scales and outcome measures. Therefore caution is required in drawing generalized conclusions. In the studies that used the term "debriefing," the intervention was performed in various ways. A few of these counseling sessions included elements of CISD (31,32,34) but one did not (37). CISD is a structured form of debriefing developed for acute crisis management, whereas the term "debriefing" is used for a broad variety of interventions.

Future studies with more women, clear interventions and less bias are necessary to draw firmer conclusions. Examples of bias that are (potentially) present in the included studies are lack of proper randomization (36,37,39,43) and the absence of clarity on specific intervention or study characteristics (34,37,40). An overview on types of bias for each included study is given in Table 2. One aspect that should be addressed is the expedient timing of a preventive intervention, since many people who have experienced severe traumatic stress show a spontaneous recovery in the months after the event (46) and therefore interventions are potentially delivered to people who might spontaneously have remitted without intervention (47). However, an active approach to prevent or treat PTSD and PTSD symptoms at an early stage could perhaps also lead to fewer or less severe cases of PTSD. This can primarily be done by identifying women who had a traumatic birth experience. Because a seemingly uncomplicated childbirth can lead to PTSD symptoms, the first step in recognizing a traumatic birth experience is openly to ask each postpartum woman about her feelings and thoughts concerning the delivery. Several questionnaires have been developed to support the clinician in this process, such as the Wijma Delivery Expectancy/Experience Questionnaire (version B) (48) and the Delivery Satisfaction Scale (49). The combination of having a traumatic or negative childbirth experience and having other risk factors for the development of PTSD following childbirth, such as fear of childbirth or medical interventions during delivery such as an emergency cesarean section or the use of a forceps or vacuum (16), should raise the alarm for the caregiver concerning possible development of PTSD symptoms. Screening women who are at high risk of developing PTSD following childbirth can help to increase the efficacy of preventative interventions, since the prevalence of PTSD varies from 3.1% in the general population to 15.7% in high-risk groups (15). Lapp noted that "resources should be spent on identifying individuals most at risk for the development of problems after traumatic events, and developing interventions aimed at them" (18). Besides improving efficacy, focusing on risk groups can also help limit health costs.

This review is the first systematic review on the prevention of a traumatic childbirth and childbirth-related PTSD. The literature on PTSD due to other types of trauma emphasizes the importance of early detection of developing psychopathology and states that more research should be initiated on screen and treat programs. Childbirth-related PTSD is not different in its need for more research on prevention.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1. Evidence table for secondary prevention.