



HAL
open science

Childbirth as an anticipated trauma during pregnancy: pretraumatic stress symptoms in primiparous women

Lara Suchanecki, Nelly Goutaudier

► **To cite this version:**

Lara Suchanecki, Nelly Goutaudier. Childbirth as an anticipated trauma during pregnancy: pretraumatic stress symptoms in primiparous women. *Journal of Reproductive and Infant Psychology*, In press, 10.1080/02646838.2022.2137118 . hal-03922075

HAL Id: hal-03922075

<https://hal.science/hal-03922075>

Submitted on 15 Jan 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

**Childbirth as an Anticipated Trauma during Pregnancy: Pretraumatic Stress
Symptoms in Primiparous Women**

Lara Suchanecki & Nelly Goutaudier

Centre de Recherches sur la Cognition et l'Apprentissage -UMR CNRS 7295, Université de
Poitiers, Poitiers, France

Corresponding author:

Nelly Goutaudier, Ph.D
Full Professor

CeRCA-UMR CNRS 7295
5, rue Théodore Lefebvre, MSHS-Bâtiment A5
86073 Poitiers, Cedex 9 FRANCE
E-mail: nelly.goutaudier@univ-poitiers.fr
Tel : +33 (0)6 19 10 31 73
Fax : +33 (05) 49 45 32 44

Childbirth as an Anticipated Trauma during Pregnancy: Pretraumatic Stress Symptoms in Primiparous Women

Abstract:

Introduction: While childbirth is predictable, some aspects of delivery remain unknown, which can lead women to perceive childbirth threatening. Thus, women can develop anticipated traumatic reactions related to the forthcoming delivery through “pretraumatic stress” symptoms. The present cross-sectional study aims at extending prior findings by: a) exploring the frequency of **probable** pretraumatic stress disorder in primiparous pregnant women, b) evidencing associated features of pretraumatic stress symptoms and c) exploring which specific components of antenatal anxiety are associated with pretraumatic stress symptoms. **Methods:** A sample of 100 primiparous pregnant women completed an online questionnaire assessing pretraumatic stress, fear of childbirth, depressive and anxiety symptoms. Socio-demographic and pregnancy-related data were also gathered. **Results:** 8 % of women met all criteria for **probable pretraumatic stress disorder** with the forthcoming delivery as the traumatic event. Increased depressive symptoms ($\beta = 0.48, p < .05$), childbirth concerns ($\beta = 0.47, p < .05$) and worry about self ($\beta = 0.74; p < .05$) **were associated with** the intensity of pretraumatic stress **disorder** symptoms. **Conclusion:** This study contributes to the very limited literature on pretraumatic stress **symptoms**. To the best of our knowledge, this is the first study conducted exclusively on primiparous pregnant women. Thus, it is noteworthy that pretraumatic stress is not a reactivation of a former postpartum PTSD or associated with a prior negative experience of childbirth. Future studies conducted on primiparous women with no history of traumatic exposure could allow to provide additional evidences of the existence of anticipated traumatic reactions of childbirth.

Keywords: Pretraumatic stress; Pregnancy; Primiparous; Traumatic reactions; Anticipation

Introduction

Pregnancy is an important event for women that might lead to psychological impairments (Asselmann et al., 2020; Johnson et al., 2018). Many studies have been conducted on pregnancy-related psychopathological disorders with a special attention paid to depression that affects 15% of women (see Okagbue et al., 2019, for a systematic review). Anxiety is also quite common during pregnancy (Grigoriadis et al., 2018) with a prevalence of self-reported anxiety symptoms ranging from 18.2 to 24.6 % depending on the trimesters of pregnancy (see Dennis, et al., 2018, for a meta-analytic review).

To date, while the majority of research focuses on anxiety and depressive disorders during pregnancy, traumatic reactions are receiving an increasing attention. Given that mothers can perceive a threat to their own life and/or the infant's life (American Psychiatric Association, APA, 2013), giving birth can lead to Posttraumatic Stress Disorder (PTSD) symptoms (Dekel et al., 2017). As for any other traumatic events, symptoms of PTSD following childbirth include avoidance, intrusions, negative alterations in cognitions and mood as well as alterations in arousal and reactivity (APA, 2013). According to meta-analytic reviews, the mean prevalence of postpartum PTSD ranges from 3.1%, to 4.7 depending on the reviews (Grekin & O'Hara, 2014; Heyne et al., 2022).

Experiencing PTSD symptoms is not only distressing for the mother but also for the entire family. Indeed, it is now acknowledged that maternal PTSD symptoms can lead to marital difficulties (e.g. Garthus-Niegel et al., 2018; Parfitt & Ayers, 2009). Postpartum PTSD can also have a negative impact on mother-infant bonding (Muziket al., 2013; Parfitt & Ayers, 2009) or on the infant's socio-emotional development (e.g. Enlow et al., 2011; Garthus-Niegel et al., 2017). Thus, early detection of postpartum PTSD appears of prime importance.

Consistent with findings from the general trauma literature, (see. Brewin et al., 2000, for a meta-analytic review on risk factors for PTSD), studies focusing on postpartum PTSD have suggested that traumatic history is an important risk factor to take into account (e.g. Lev-Wiesel & Daphna-Tekoah, 2010; Lev-Wiesel et al., 2009; Oh, et al., 2016). Unlike the majority of potentially traumatic events that cannot be predictable, childbirth is an expected event that paves the way for pregnant women to develop anticipated traumatic reactions regarding their upcoming delivery. While childbirth is predictable, some aspects of labour remain unknown. Thus, this aspect of delivery may lead pregnant women to perceive childbirth as a threat (Söderquist et al., 2004). Even though research in this area is still at an early stage, such reactions named “pre traumatic stress symptoms”, have been found in pregnant women.

To date, pretraumatic stress disorder is not considered as a disorder *per se* and is not mentioned in any of the classifications of mental disorders (e.g. Diagnostic and Statistical Manual of Mental Disorders 5th edition-DSM-5, APA, 2013). Nevertheless, an adaptation of PTSD diagnostic criteria was proposed to explore clinical features of probable pretraumatic stress disorder. Thus, based on DSM-5 criteria for PTSD adapted for a forthcoming traumatic event, this proposed disorder consists of 4 categories of symptoms: intrusion, avoidance of thoughts and behaviours, changes in arousal and reactivity as well as negative changes in thoughts and mood. As an example, regarding intrusive symptoms, women can experience pre-experiencing repeated, unwanted and disturbing images of the forthcoming delivery such as flash-forwards. Avoidance symptoms consist of avoiding thoughts related to the upcoming delivery, or conversations related to childbirth. Thus, pretraumatic stress reactions are similar to PTSD symptoms but, instead of being related to a prior traumatic event, they develop as a result of the anticipated traumatic appraisal of the forthcoming childbirth. As for any other

trauma-and stressor-related disorder, the severity of symptoms can negatively affect daily functioning.

A study conducted on a sample of 1,224 Swedish women has found that of all participants, 2.3% met all DSM-IV criteria for PTSD related to their forthcoming delivery and 5.8% fulfilled criteria B, C, and D (Söderquist et al., 2004). A study conducted on a sample of 102 French women has also reported similar results with 8.8% of women meeting all criteria, 34.3% meeting criterion B, 14.7% meeting criterion C and 64.7% meeting criterion D (Goutaudier et al., 2019). Pretraumatic stress symptoms have also been found in a sample of 610 male soldiers before deployment to Afghanistan (Berntsen & Rubin, 2015). Noteworthy, there was a positive correlation between pretraumatic stress symptoms and several well-known risk factors for PTSD (e.g. Neuroticism, depressive symptoms). Interestingly, findings from this longitudinal study have also evidenced PTSD symptoms during and after a 6-month deployment to Afghanistan and the intensity of pretraumatic stress symptoms before deployment predicted subsequent PTSD symptoms (Berntsen & Rubin, 2015). Taking together, these findings suggest that pretraumatic reactions might exist in the context of a predictable trauma, regardless of the event or the gender (Berntsen & Rubin, 2015; Goutaudier et al., 2019; Söderquist et al., 2004).

While studies in the area are still lacking, several factors associated with pretraumatic stress symptoms in pregnant have been reported. Söderquist et al. (2004) have found that history of psychological problems, prior psychiatric counseling related to childbirth, elevated anxiety, and depressive symptoms were significant risk factors for pretraumatic stress symptoms. Goutaudier et al., (2019) have evidenced fear of childbirth, fear of labour pain, antenatal anxiety and depressive symptomatology as significant independent predictors of the intensity of pretraumatic stress symptoms. While adding important findings into the field of pretraumatic stress, it is important to note that these studies have been conducted on both

primiparous and multiparous women. As a consequence, it cannot be excluded that anticipated trauma of childbirth could be due, for multiparous women, to a prior traumatic experience of childbirth. Thus, replicating these studies on primiparous pregnant women appears of prime importance to fully assess the existence of pretraumatic stress. Prior studies have used the State-Trait Anxiety Inventory (STAI) to measure anxiety traits (Söderquist et al., 2004), or the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS) to assess anxiety symptoms (Goutaudier et al., 2019). Even though anxiety appears to be a potential risk factor for pretraumatic stress symptoms, no data is available regarding whether or not such anxiety was specifically related to pregnancy. Pregnancy-related anxiety refers to the fear, and worry related to pregnancy, childbirth, infant's health and other pregnancy-related financial or social issues (Bayrampour et al., 2016). Women suffering from pregnancy-related anxiety symptoms can also develop concerns about their physical appearance or their capability as a mother (Rini et al., 1999). To date, several scales exist for measuring pregnancy-related anxiety (see Brunton et al., 2015, for a systematic review). A recent review aiming at identifying available measurement worldwide has evidenced that the Pregnancy- Related Anxiety Scale (PRAS) (Van den Bergh, 1990) and the Pregnancy-Related Anxiety Scale (PRAS) (Brunton et al., 2019) were the most commonly used. As a consequence, using measures covering several aspects of pregnancy-related anxiety is needed to provide additional findings in the field of pretraumatic stress.

Recent studies have emphasized the need to focus on pretraumatic stress as it might be involved in the development of postpartum PTSD (Goutaudier et al., 2019; Goutaudier et al., 2020). Indeed, pretraumatic stress symptoms were highlighted as a risk factor for subsequent PTSD following childbirth (Söderquist et al., 2009; Söderquist et al., 2004), suggesting the existence of a probable continuum of traumatic reactions from pre to postpartum and the possibility for traumatic reactions related to childbirth to be early

screened and prevented. Thus, identifying factors associated with pretraumatic stress symptoms can have clinical implications not only for pregnant women but also for women in the postpartum period.

The present cross-sectional study aims at extending prior findings by: a) exploring the frequency of **probable pretraumatic stress disorder symptoms** related to the forthcoming delivery in primiparous pregnant women, b) evidencing associated features of pretraumatic stress symptoms and c) exploring which specific components of antenatal anxiety are associated with posttraumatic stress symptoms. Based on prior studies, we made the hypothesis that fear of childbirth, prior traumatic exposure, antenatal anxiety and depressive symptoms would be correlated with the intensity of pretraumatic stress symptoms related to the forthcoming delivery.

Methods

Participants and procedure

Potential participants, recruited through social networks, were informed that the study aimed at exploring their experience of pregnancy. They were informed that participation will be anonymous and not financially compensated. They were also informed that data will only be analyzed for scientific purposes. Inclusion criteria were: being over 18, speaking French fluently, and being primiparous. A total of 100 primiparous pregnant women (mean (SD) age = 26.13 (4.82); min = 18, max = 41 years old) agreed to participate. Mean week's gestation was 28.17 (range 8–41; SD = 8.6). A consent form was signed by ticking a box before the completion of the online survey. The study received the approval of the French data protection authority and followed the ethical guidelines of the Helsinki declaration (see table 1 for participants' characteristics).

-----Insert table 1 here-----

Measures

Background data. A background data questionnaire was created. Regarding sociodemographic variables, items were used to obtain information about whether or not women lived with their life partner and were employed (yes/no answers). Data about educational level (multiple choice answer) and age (open-ended answer) were also collected. Concerning psychological, traumatic, and pregnancy-related variables, women were asked whether or not they experienced a prior traumatic event, had a gynecological history, were hospitalized during pregnancy, planned an epidural anesthesia or attended preparation to childbirth classes (yes/ no answers). They were also asked to provide information about week's gestation (open-ended answer) and type of delivery planned (multiple choice answer).

Pretraumatic stress symptoms. Pretraumatic stress symptoms (i.e. traumatic symptoms related to the forthcoming delivery) were assessed using the French version of the Traumatic Event Scale (Söderquist et al., 2004). The TES, was developed in accordance with the DSM-IV criteria for PTSD. Four items focus on criterion A for PTSD and 17 items on criteria B, C, and D. In this 21-item self-report questionnaire, the forthcoming delivery is used as the traumatic event (example of item: "*I have unpleasant dreams about childbirth*"). Items are rated on a 4-point scale (never/not at all, rarely, sometimes, or often) with increased scores indicating an increased level of pretraumatic stress symptoms. This scale measures 5 dimensions of pretraumatic stress symptoms (anticipation of trauma, hyperarousal, numbing, avoidance, intrusive symptoms). In our sample, $\alpha = .89$.

Fear of Childbirth. Fear of childbirth was assessed using the Wijma Delivery Experience/Expectancy Questionnaire (W-DEQ) version a (Wijma et al., 1998). This is a 33-item self-report questionnaire with responses rated on a 6-point Likert-type scale ranging from 0 (not at all) to 5 (extremely). Total score range from 0 to 165 with higher score indicating an elevated fear of childbirth (example of item: "*How do you imagine it will feel*

the very moment you give birth to your baby? Extremely frightened?”). As no French validation of this scale currently exists, a French version, translated/back-translated by researchers fluent in both languages, has been used. This version has been used in prior studies and has demonstrated good psychometric properties (e.g. Perier et al., 2016; Poggi et al., 2018). In our sample, $\alpha = .73$.

Depressive symptoms. Depressive symptoms were assessed using the Patient Health Questionnaire (PHQ-9), a 9-item self-report questionnaire (Kroenke et al., 2001). Items are rated on a 4-point scale from 0 (not at all) to 3 (nearly every day) (example of item: “*Over the last 2 weeks, how often have you been bothered by any of the following problems? Feeling down, depressed, or hopeless*”). Total score range from 0 to 27 with higher score indicating elevated depressive symptoms. This instrument has been previously used in sample of pregnant women (Sidebottom et al., 2012; Zhong et al., 2015). A study focusing on psychometric properties of instruments assessing prenatal depressive symptoms has also shown that the PHQ-9 was a reliable instrument for measuring depressive symptoms in both pregnant and postpartum women with few significant differences in performances while comparing with the Edinburgh Postnatal Depression Scale (EPDS) (Flynn et al., 2011). In our sample $\alpha = .79$.

Pregnancy-related anxiety. Pregnancy-related anxiety was assessed using the Pregnancy-related Anxiety Scale (PrAS; Brunton, et al., 2018). This 33-item self-report questionnaire contains 8 subscales: Childbirth concerns, Body image concerns, Attitudes towards childbirth, Worry about self, Baby concerns, Acceptance of pregnancy, Avoidance and Attitudes towards medical staff. Items are scored on a 4-point scale ranging from 1 to 4 (example of item: “*I feel afraid of the invasiveness of childbirth*”). Higher scores are indicative of increased pregnancy-related anxiety. Scores can be summed to provide a sub-score score for each sub-scale. In our sample, $\alpha = .89$.

Statistical analyses

Pearson correlations were conducted in order to examine the relationship between the PHQ-9, the PrAS, the W-DEQ and the TES. A correlation analysis between age and the TES was also conducted. Groups were established for each participant according to psychological, traumatic, and pregnancy-related variables (e.g. *planning a cesarean section vs. vaginal delivery*) and sociodemographic variables (e.g. *professional activity vs. unemployment*). Groups were then compared by their mean scores of pretraumatic stress through a series of Student's *t*-test and an ANOVAs for stage of pregnancy (i.e. first, second or third trimester). Finally, multiple regression analyses were used to identify independent significant predictor for elevated pretraumatic stress symptoms. The choice of statistical predictors to test was made after examination of mean comparisons analyses and correlations. We only included variables that had a significant influence on TES scores. The significance level was set to 0.05 (two-tailed). All the analyses were conducted using STATISTICA version 13.

Results

Prevalence of pretraumatic stress symptoms

Of all participants, 8 % met all criteria for probable pretraumatic stress disorder with the forthcoming delivery used as the traumatic event. Twenty-two percent of women met criterion B (i.e. intrusion), 29% met criterion C (i.e. avoidance and numbing) and 32% met criterion D (i.e. hyperarousal).

Correlations between fear of childbirth, depressive symptoms, anxiety-related symptoms and pretraumatic stress symptoms

Pearson correlations highlighted that the intensity of pretraumatic stress symptoms was positively correlated with depressive symptoms ($r=0.62$; $p < 0.05$) and fear of childbirth symptoms ($r=0.41$; $p < 0.05$). Regarding pregnancy-related anxiety, the intensity of pretraumatic stress symptoms was also positively correlated with childbirth concerns ($r=0.69$; $p < 0.05$), body image concerns ($r=0.49$; $p < 0.05$), worry about self ($r=0.76$; $p < 0.05$), baby concerns ($r=0.64$; $p < 0.05$), avoidance ($r=0.42$; $p < 0.05$), attitudes towards medical staff ($r=0.52$; $p > 0.05$). No significant correlations were found between pretraumatic stress symptoms and attitudes towards childbirth ($r=0.11$; $p > 0.05$) or acceptance of pregnancy ($r=0.09$; $p > 0.05$).

Mean comparisons according to obstetrical, psychological and sociodemographic variables

Women who reported a prior exposure to a traumatic event had an average score on the TES significantly higher than those who did not report experiencing a traumatic event ($M= 44.61$; $SD= 15.57$ vs. $M= 38.29$; $SD= 9.53$; $t=-2.03$; $p = .008$). No significant correlation was found between pretraumatic stress symptoms and age ($r= -0.06$; $p > 0.05$). No differences were observed regarding other obstetrical, psychological and sociodemographic variables (see table 2).

-----Insert table 2 here-----

Predictors of the intensity of pretraumatic stress symptoms.

A multiple regression analysis was conducted for identifying the independent predictors of the intensity of pretraumatic stress symptoms. We only included variables that were associated with TES scores (i.e. Depressive symptoms, fear of childbirth symptomatology, childbirth concerns, body image concerns, worry about self, baby concerns, avoidance, attitude towards medical staff, and prior exposure to traumatic event). The unique contribution of each independent variable was reported with regression coefficient (beta), and

p value. The proportion of the variance in frequency of pretraumatic stress symptoms by the independent variables was reported with the multiple R^2 . Prior exposure to traumatic event was entered in a first step and was not significant ($\beta = 0.05 < .05$) (see table 3). The final model explained 73% of the variance and was also significant ($F(9,90)=31,498$ $p<0,00001$. adjusted $R^2= 0.73$). Increased depressive symptoms ($\beta = 0.48, p< .05$), childbirth concerns ($\beta = 0.47, p< .05$) and worry about self ($\beta = 0.74; p< .05$) were independently associated with pretraumatic stress symptoms (see table 3).

-----Insert table 3 here-----

Discussion

The present study aimed at exploring the frequency of pretraumatic stress disorder in primiparous pregnant women and evidencing associated features of pretraumatic stress symptoms. With 8 % of our study sample meeting all criteria for probable pretraumatic stress disorder, our findings provide additional support for the existence of pretraumatic stress symptoms related to the forthcoming delivery. While prior studies have evidenced pretraumatic stress symptoms in pregnant women (Goutaudier et al., 2020; Goutaudier et al., 2019; Söderquist et al., 2004), to the best of our knowledge, this is the first study conducted exclusively on primiparous women. Even though results from Goutaudier et al.'s study have reported no significant difference between primiparous and multiparous women regarding pretraumatic stress reactions, our findings suggest that such reactions might not be related to history of a prior potential traumatic birth.

Pregnant women who reported prior exposure to a traumatic event had an average score on pretraumatic stress symptoms significantly higher than those who did not report such exposure. Nevertheless, contrary to our hypothesis and prior findings (e.g. Goutaudier et al., 2019) traumatic history was not highlighted in the multiple regression analysis as associated with the intensity of pretraumatic stress symptoms. This lack of consistency in

results between both studies might be due to difference in parity (primiparous vs. multiparous). In the present study, we only included women with no prior experience of childbirth. Then, we can make the hypothesis that exposure to traumatic event (and then a potential traumatic experience of a traumatic birth) would mostly increase the likelihood of developing pretraumatic reactions in multiparous women. Even though speculative, this could explain the inconsistency of results and lack of significance of traumatic exposure in the multiple regression analysis.

Based on prior studies, fear of childbirth symptomatology and depressive symptoms were expected to be associated with the intensity of pretraumatic stress symptoms related to the forthcoming delivery. As expected, significant results were found for depressive symptoms. This result is consistent with prior findings evidencing the high comorbidity between depression and PTSD following childbirth or exposure to other type of traumatic event (e.g. Contractor et al., 2018; Grekin & O'Hara, 2014; Nichter et al., 2019). Noteworthy there is an overlap between depressive and pretraumatic stress symptoms. While avoidance and intrusive symptoms are specific to traumatic reactions, negative alterations in cognition and mood are commonly found not only in women suffering from pretraumatic stress symptoms but also in individuals showing depressive symptoms. For instance, self-blame, negative emotional state or inability to experience happiness can be developed. Marked alterations in arousal and reactivity (e.g. problems with concentration or sleep disturbance) are also shared symptoms. Thus, developing longitudinal studies are of prime importance to evaluate whether or not antenatal depressive symptoms are a risk factor of the development or maintenance of pretraumatic stress. Interestingly, while fear of childbirth was correlated with pretraumatic stress, it was not highlighted in the multiple regression analysis as associated with the intensity of pretraumatic stress symptoms. A prior study aiming at identifying profiles of women based on pretraumatic stress and FOC symptoms has suggested

that, while sharing some similarities, these constructs are clearly different (Goutaudier et al., 2020). Thus, taking together, these results suggest that, while a comorbidity can exist between both reactions, FOC would not participate into the development of pretraumatic stress but would rather be a comorbid disorder.

It should be noted that, by highlighting specific components of antenatal anxiety associated with pretraumatic stress, our results extend prior findings that only took into account anxiety as a global construct (e.g. Goutaudier et al., 2019; Söderquist et al., 2004). Moreover, anxiety assessed in previous studies was not specially related to pregnancy. In our study, two components of antenatal anxiety (childbirth concerns and worry about self) were **associated with** elevated pretraumatic stress symptoms. Interestingly, items from the childbirth concerns sub-scale are related to potential injuries (e.g. worrying about being cut or harmed) and meet criterion A for PTSD. This result suggests that the anticipation of childbirth as a life-threatening event plays a part in the development of pretraumatic stress symptoms. Thus, we can assume that, while the exposure to a traumatic event is a mandatory criterion for PTSD, it is a key component of the development of symptoms for anticipated traumatic reactions.

Regarding the “worry about self” subscale, items are related to anxiety regarding possible issues as a mother (e.g. I worry that I won't do a good job as a mother, I worry about caring for the baby once I am home). Prior studies in the field of postpartum traumatic reactions have shown that women with PTSD following childbirth can also have difficulties to invest their mother role (e.g. Goutaudier et al., 2011). As a consequence, it appears of prime importance to guide women into the investment of their new role as a mother. The avoidance subscale of the antenatal anxiety scale was not associated with pretraumatic symptoms. Given that avoidance is a part of the pretraumatic stress symptomatology, this lack of association appears counterintuitive but might be explained by the nature of the items

of this subscale. Indeed, the avoidant subscale contains items related to the type of delivery (e.g. I may consider a caesarian to avoid a vaginal birth) and does not refer to avoidance of delivery *per se*. Thus, supported by the lack of significant differences between women who plan a c-section and women who plan a vaginal delivery, pretraumatic stress does not appear related to the type of delivery. As it is acknowledged that having a cesarean delivery is a risk factor for postpartum PTSD (see Olde et al., 2006, for a review), this result suggests that, while having an impact on posttraumatic reactions, the type of delivery does not necessarily influence pretraumatic symptoms.

Although this study provides some important insights on pretraumatic stress symptoms, some limitations need to be acknowledged. First, given the small sample (N=100), our results are not representative of all primiparous pregnant women. Then, given the discrepancies between medical cares during pregnancy across countries, our results might not be generalized to non-French women, suggesting the need from cross-cultural replications. Given that it is the most commonly used instrument in the literature on pretraumatic stress in pregnant women and also the only available scale in French language, we used the Traumatic Event Scale (TES) to assess pretraumatic stress symptoms. As this instrument is based on DSM-IV-TR criteria for PTSD, future studies on pretraumatic stress should be conducted using scales or clinical interviews based on DSM-5 criteria. We did not assess a potential indirect exposure to a traumatic birth (e.g learning that a close relative experienced a traumatic birth or working as a health professional in a maternity unit), which could have impacted the results obtained. While it is an efficient strategy for recruiting research participants, data were collected using the Internet which could be considered as an important limitation. Indeed, we cannot exclude the risk of results being biased by the participation of women who felt more involved in the research topic, with potential impact on probable pretraumatic stress disorder. Thus, including women recruited during ultrasound

appointments or childbirth preparation classes appears relevant. Finally, as the cross-sectional design precludes drawing conclusion about the direction of the causality longitudinal studies are warranted.

Our findings also have clinical implications. Eye Movement Desensitization and Reprocessing (EMDR) and Cognitive Processing Therapy (CPT) are widely used as psychotherapeutic treatment for PTSD regardless of the traumatic event (see Asmundson et al., 2019; Powers et al., 2010, for meta-analytic reviews). While few studies have focused on specific treatments for postpartum PTSD, CPT and EMDR appear to be promising therapies for PTSD following childbirth (Chiorino et al., 2020; Gobin et al., 2022). Given the similarities between pre and posttraumatic stress symptoms, these psychotherapies could be adapted for traumatic reactions during pregnancy. Clinicians should also consider the overlap between pretraumatic stress and depressive symptoms and targeting both disorders.

To conclude, this study contributes to the very limited literature on pretraumatic stress. As such symptoms were found in primiparous women, it is noteworthy that pretraumatic is not a reactivation of a former postpartum PTSD or associated with a prior negative experience of childbirth. Future studies conducted on primiparous women with no history of traumatic exposures could allow to provide additional evidence of childbirth as a pretraumatic event. Additional longitudinal studies are also needed to evidence whether or not women with pretraumatic stress symptoms during pregnancy develop peritraumatic reactions during labour and PTSD in the aftermath of childbirth.

Disclosure statement: none

Funding: none

References

- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.).
- Asselmann, E., Kunas, S. L., Wittchen, H. U., & Martini, J. (2020). Changes in psychopathological symptoms during pregnancy and after delivery: A prospective-longitudinal study in women with and without anxiety and depressive disorders prior to pregnancy. *Journal of Affective Disorders*, 263, 480-490.
- Asmundson, G. J., Thorisdottir, A. S., Roden-Foreman, J. W., Baird, S. O., Witcraft, S. M., Stein, A. T., ... & Powers, M. B. (2019). A meta-analytic review of cognitive processing therapy for adults with posttraumatic stress disorder. *Cognitive Behaviour Therapy*, 48(1), 1-14.
- Bayrampour, H., Ali, E., McNeil, D. A., Benzies, K., MacQueen, G., & Tough, S. (2016). Pregnancy-related anxiety: A concept analysis. *International journal of nursing studies*, 55, 115-130.
- Berntsen, D., & Rubin, D. C. (2015). Pretraumatic stress reactions in soldiers deployed to Afghanistan. *Clinical Psychological Science*, 3(5), 663-674.
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68(5), 748.
- Brunton, R. J., Dryer, R., Krägeloh, C., Saliba, A., Kohlhoff, J., & Medvedev, O. (2018). The pregnancy-related anxiety scale: A validity examination using Rasch analysis. *Journal of Affective Disorders*, 236, 127-135.
- Brunton, R. J., Dryer, R., Saliba, A., & Kohlhoff, J. (2015). Pregnancy anxiety: A systematic review of current scales. *Journal of affective disorders*, 176, 24-34.

Chiorino, V., Cattaneo, M. C., Macchi, E. A., Salerno, R., Roveraro, S., Bertolucci, G. G., ... & Fernandez, I. (2020). The EMDR Recent Birth Trauma Protocol: a pilot randomised clinical trial after traumatic childbirth. *Psychology & Health, 35*(7), 795-810.

Contractor, A. A., Greene, T., Dolan, M., & Elhai, J. D. (2018). Relations between PTSD and depression symptom clusters in samples differentiated by PTSD diagnostic status. *Journal of Anxiety Disorders, 59*, 17-26.

Dekel, S., Stuebe, C., & Dishy, G. (2017). Childbirth induced posttraumatic stress syndrome: a systematic review of prevalence and risk factors. *Frontiers in Psychology, 8*, 560.

Dennis, C. L., Falah-Hassani, K., & Shiri, R. (2017). Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. *The British Journal of Psychiatry, 210*(5), 315-323.

Enlow, M. B., Kitts, R. L., Blood, E., Bizarro, A., Hofmeister, M., & Wright, R. J. (2011). Maternal posttraumatic stress symptoms and infant emotional reactivity and emotion regulation. *Infant Behavior and Development, 34*(4), 487-503.

Flynn, H. A., Sexton, M., Ratliff, S., Porter, K., & Zivin, K. (2011). Comparative performance of the Edinburgh Postnatal Depression Scale and the Patient Health Questionnaire-9 in pregnant and postpartum women seeking psychiatric services. *Psychiatry Research, 187*(1-2), 130-134.

Garthus-Niegel, S., Ayers, S., Martini, J., von Soest, T., & Eberhard-Gran, M. (2017). The impact of postpartum post-traumatic stress disorder symptoms on child development: a population-based, 2-year follow-up study. *Psychological Medicine, 47*(1), 161-170.

Garthus-Niegel, S., Horsch, A., Handtke, E., Von Soest, T., Ayers, S., Weidner, K., & Eberhard-Gran, M. (2018). The impact of postpartum posttraumatic stress and

depression symptoms on couples' relationship satisfaction: a population-based prospective study. *Frontiers in Psychology*, 19(9), 17-28.

Gobin, K., Boyd, J., & Green, S. M. (2022). Cognitive Processing Therapy for Childbirth-Related Posttraumatic Stress Disorder: A Case Report. *Cognitive and Behavioral Practice*. <https://doi.org/10.1016/j.cbpra.2021.12.004>

Goutaudier, N., Ayache, R., Aubé, H., & Chabrol, H. (2020). Traumatic anticipation of childbirth and disordered eating during pregnancy. *Journal of Reproductive and Infant Psychology*, 38(3), 243-258.

Goutaudier, N., Bertoli, C., Séjourné, N., & Chabrol, H. (2019). Childbirth as a forthcoming traumatic event: pretraumatic stress disorder during pregnancy and its psychological correlates. *Journal of Reproductive and Infant Psychology*, 37(1), 44-55.

Goutaudier, N., Lopez, A., Séjourné, N., Denis, A., & Chabrol, H. (2011). Premature birth: subjective and psychological experiences in the first weeks following childbirth, a mixed-methods study. *Journal of Reproductive and Infant Psychology*, 29(4), 364-373.

Grekin, R., & O'Hara, M. W. (2014). Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. *Clinical Psychology Review*, 34(5), 389-401.

Grigoriadis, S., Graves, L., Peer, M., Mamisashvili, L., Tomlinson, G., Vigod, S. N., ... & Dawson, H. (2018). A systematic review and meta-analysis of the effects of antenatal anxiety on postpartum outcomes. *Archives of Women's Mental Health*, 22, 543-556

Heyne, C. S., Kazmierczak, M., Souday, R., Horesh, D., Lambregtse-van den Berg, M., Weigl, T., ... & Garthus-Niegel, S. (2022). Prevalence and risk factors of birth-related posttraumatic stress among parents: A comparative systematic review and meta-analysis. *Clinical Psychology Review*, 94, 102157.

- Johnson, A. R., George, M., Goud, B. R., & Sulekha, T. (2018). Screening for mental health disorders among pregnant women availing antenatal care at a government maternity hospital in Bengaluru city. *Indian Journal of Psychological Medicine, 40*(4), 343.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606-613.
- Lev-Wiesel, R., Daphna-Tekoah, S., & Hallak, M. (2009). Childhood sexual abuse as a predictor of birth-related posttraumatic stress and postpartum posttraumatic stress. *Child Abuse & Neglect, 33*(12), 877-887.
- Lev-Wiesel, R., & Daphna-Tekoah, S. (2010). The role of peripartum dissociation as a predictor of posttraumatic stress symptoms following childbirth in Israeli Jewish women. *Journal of Trauma & Dissociation, 11*(3), 266-283.
- Muzik, M., Bocknek, E. L., Broderick, A., Richardson, P., Rosenblum, K. L., Thelen, K., & Seng, J. S. (2013). Mother–infant bonding impairment across the first 6 months postpartum: the primacy of psychopathology in women with childhood abuse and neglect histories. *Archives of Women's Mental Health, 16*(1), 29-38.
- Nichter, B., Norman, S., Haller, M., & Pietrzak, R. H. (2019). Psychological burden of PTSD, depression, and their comorbidity in the US veteran population: Suicidality, functioning, and service utilization. *Journal of Affective Disorders, 256*, 633-640.
- Oh, W., Muzik, M., McGinnis, E. W., Hamilton, L., Menke, R. A., & Rosenblum, K. L. (2016). Comorbid trajectories of postpartum depression and PTSD among mothers with childhood trauma history: Course, predictors, processes and child adjustment. *Journal of Affective Disorders, 200*, 133-141.
- Olde, E., van der Hart, O., Kleber, R., & van Son, M. (2006). Posttraumatic stress following childbirth: a review. *Clinical psychology review, 26*(1), 1-16.

- Okagbue, H. I., Adamu, P. I., Bishop, S. A., Oguntunde, P. E., Opanuga, A. A., & Akhmetshin, E. M. (2019). Systematic Review of Prevalence of Antepartum Depression during the Trimesters of Pregnancy. *Open Access Macedonian Journal of Medical Sciences*, 7(9), 1555.
- Parfitt, Y. M., & Ayers, S. (2009). The effect of post-natal symptoms of post-traumatic stress and depression on the couple's relationship and parent–baby bond. *Journal of Reproductive and Infant Psychology*, 27(2), 127-142.
- Perier, S., Gautier, J., O'reilly, A., & Séjourné, N. (2016). Le rôle de l'optimisme et de l'anxiété dans la peur de l'accouchement: une étude exploratoire. *Journal de thérapie comportementale et cognitive*, 26(4), 170-179.
- Poggi, L., Goutaudier, N., Séjourné, N., & Chabrol, H. (2018). When fear of childbirth is pathological: the fear continuum. *Maternal and Child Health Journal*, 22(5), 772-778.
- Powers, M. B., Halpern, J. M., Ferenschak, M. P., Gillihan, S. J., & Foa, E. B. (2010). A meta-analytic review of prolonged exposure for posttraumatic stress disorder. *Clinical Psychology Review*, 30(6), 635-641.
- Rini, C. K., Dunkel-Schetter, C., Wadhwa, P. D., & Sandman, C. A. (1999). Psychological adaptation and birth outcomes: the role of personal resources, stress, and sociocultural context in pregnancy. *Health Psychology*, 18(4), 333.
- Sidebottom, A. C., Harrison, P. A., Godecker, A., & Kim, H. (2012). Validation of the Patient Health Questionnaire (PHQ)-9 for prenatal depression screening. *Archives of Women's Mental Health*, 15(5), 367-374.
- Söderquist, J., Wijma, B., Thorbert, G., & Wijma, K. (2009). Risk factors in pregnancy for post-traumatic stress and depression after childbirth. *BJOG: An International Journal of Obstetrics & Gynaecology*, 116(5), 672-680.

Söderquist, J., Wijma, K., & Wijma, B. (2004). Traumatic stress in late pregnancy. *Journal of Anxiety Disorders, 18*(2), 127-142.

Van den Bergh, B. R. H. (1990). The influence of maternal emotions during pregnancy on fetal and neonatal behavior. *Journal of Prenatal & Perinatal Psychology & Health, 5*(2), 119.

Wijma, K., Wijma, B., & Zar, M. (1998). Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. *Journal of Psychosomatic Obstetrics & Gynecology, 19*(2), 84-97.

Zhong, Q. Y., Gelaye, B., Rondon, M. B., Sánchez, S. E., Simon, G. E., Henderson, D. C., ... & Williams, M. A. (2015). Using the Patient Health Questionnaire (PHQ-9) and the Edinburgh Postnatal Depression Scale (EPDS) to assess suicidal ideation among pregnant women in Lima, Peru. *Archives of Women's Mental Health, 18*(6), 78

Table 1: Sociodemographic and obstetric characteristics of the study population (N=100)

Variables	N
<i>Psychological and medical variables</i>	
Exposure to a prior traumatic event	43
Gynecological history	38
Hospitalization during pregnancy	5
Preparation to childbirth classes	54
<i>Individual variables</i>	
Professional activity	74
Living with partner	93
Education	
No diploma	5
Less than high school degree	18
High school degree	23
B.A.	36
M.A.	11
More than M.A.	7
<i>Variables related to delivery</i>	
Pregnancy stages	
First trimester	11
Second trimester	23
Third trimester	66
Type of delivery planned	
Vaginal delivery	94
C-section	6
Does not know yet	
Epidural anesthesia planned	
Yes	51
No	14
Uncertain	35

PRETRAUMATIC STRESS IN PRIMIPAROUS PREGNANT WOMEN

Table 2: Mean comparison of TES scores according to obstetrical, medical, and psychological, history in a sample of 100 primiparous women (using *t* tests and ANOVAs)

			Mean EPA	SD
Stage of pregnancy	F(2.94)=0.57, p=.56			
First trimester			41.12 ^a	13.53
Second trimester			40.39 ^b	11.56
Third trimester			38.19 ^c	9.88
	Yes	No	<i>t</i>	<i>p</i>
	Mean score On the TES	Mean score On the TES		
<i>Medical and psychological variables</i>				
Hospitalization during pregnancy	39.92	38.17	0.73	0.26
Exposure to a prior traumatic event	44.61	38.29	-2.03	0,008*
Gynecological history	40.74	38.35	-1.08	0.28
Living with partner	38.97	43	-0.96	0.33
Planning a c-section	39.54	40.17	0.67	0.50
Planning an epidural anesthesia	39.90	40.09	-0.08	0.94
Attending birth preparation classes	38.44	40.20	0.81	0.42

*significant results for $p < .05$

Note: TES : Traumatic Event Scale (assessing pretraumatic stress symptoms)

Mean with different superscripts are not significantly different form each other

PRETRAUMATIC STRESS IN PRIMIPAROUS PREGNANT WOMEN

Table 3: Results of a linear multiple regression analysis predicting the intensity of pretraumatic stress symptoms in the pre-partum period in a sample of 100 primiparous women

	β	$t(90)$	p
Step 1 $(F(9,90)=2.56 p<0,11303. \text{ Adjusted } R^2= 0.15).$			
Traumatic event during lifetime	0.05	0.99	0.321
Step 2 $(F(9,90)=31,498 p<0,00001. \text{ Adjusted } R^2= 0.73).$			
Traumatic event during lifetime	0.05	0.99	0.321
Depressive symptoms	0.48	3.31	0.001*
Fear of childbirth symptomatology	0.05	1.36	0.175
Childbirth concerns	0.47	3.28	0.001*
Body image concerns	0.14	0.73	0.465
Worry about self	0.75	0.22	0.00001*
Baby concerns	0.12	1.66	0.334
Avoidance	0.30	0.97	0.823
Attitudes towards medical staff	0.05	0.16	0.875

*Significant results for $p < .05$

Pretraumatic stress symptoms were assessed using the *Traumatic Event Scale*