



Original research article

# Assessment of birth trauma

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## Abstract

**Aim:** The study aimed to assess the prevalence of birth trauma in postpartum women and to identify factors that may influence the development of birth trauma.

**Methods:** The sample consisted of 238 women at 6–12 weeks postpartum. Data were collected using the City Birth Trauma Scale (CityBiTS), a standardized tool that identifies a woman's potentially traumatic experiences during or after her last childbirth. The questionnaire was supplemented with sociodemographic data.

**Results:** Nearly 11% of participants experienced some form of post-traumatic stress disorder (PTSD) after childbirth. The most intense symptoms were those belonging to the hyperarousal subscale, especially feelings of nervousness, tension, irritability, and aggression. Statistically significant differences in the prevalence of birth trauma were found with regard to the presence of a birth support person ( $p = 0.044$ ) and week of gestation at the time of delivery ( $p = 0.001$ ). Differences related to participants' age, education, and type of delivery were not statistically significant.

**Conclusion:** Our findings suggest that participants only experienced birth trauma symptoms to a small extent. The CityBiTS is a useful tool for measuring postpartum trauma. Women identified as having some form of PTSD should be referred for further psychological testing and psychological care.

**Keywords:** Assessment; Birth trauma; Post-traumatic stress disorder; Risk factors

## Introduction

Pregnancy is one of the most significant periods in a woman's life. It is a time full of joy, anticipation, and preparation for the arrival of a new life. During pregnancy, women experience many changes, not only physical and hormonal, but also psychological. Although there is a wealth of resources and information that prepare women for the physical changes, the actual childbirth, and the postpartum, little information about the psychological aspects is available in Czech and Slovak medicine and obstetrics. Therefore, few women are prepared for the fact that after childbirth, besides happiness and joy, there may be feelings of anxiety or incapacity, sleep disturbances unrelated to the baby's sleep pattern, and other psychological problems. These feelings are often attributed to the hormonal changes that occur physiologically in every woman after childbirth. Since the concept of birth trauma is often underestimated, these women do not receive adequate help. Although the prevalence of these long-term sequelae is high, birth trauma in women is often trivialized and undertreated (Watson et al., 2021).

Birth trauma is defined as a feeling of distress that a woman may experience during or after childbirth. The aftermath of birth trauma can lead to a range of mental health disorders,

including post-traumatic stress disorder (PTSD), postnatal depression, anxiety, and postpartum bonding problems (Keedle et al., 2022). A woman may avoid the direct culprit of the trauma she has experienced, her newborn child (Junge-Hoffmeister and Weidner, 2021), and in extreme cases, suicidal ideation may occur (Fenech and Thomson, 2014). Other common manifestations include flashbacks, re-experiencing certain parts of the childbirth, nightmares, feeling stuck in the past, avoiding memories of the childbirth and anything related to it, physical reactions when reminded of the pregnancy and childbirth, avoiding sexual contact with the partner, neglecting gynecological checkups, frequent mood changes, hostility toward the partner, anxiety, anger, and isolating oneself from the environment (Byrne et al., 2017; Kranenburg et al., 2023). Early diagnosis and treatment of birth trauma can have a positive impact on a woman's psychological well-being, her relationship with the child, and ultimately the entire family as part of secondary prevention (Junge-Hoffmeister and Weidner, 2021; Kranenburg et al., 2023). For this reason, we believe that birth trauma, its screening and treatment should receive more attention in obstetrics.

The main aim of the study was to assess the prevalence of birth trauma in women. Another objective was to determine whether maternal age, type of delivery, duration of labor, extent of maternal birth injuries, presence of a birth support

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person, education of the woman, and week of gestation at the time of delivery have an effect on the development of birth trauma in women.

## Materials and methods

### Study design

A cross-sectional study was conducted.

### Sample

Data were collected in five gynecology centers in the Czech towns of Ostrava, Hlučín, and Havířov. The sample comprised postpartum women who met the following criteria: age 16 years or older, delivery in the last six to 12 weeks, and voluntary consent to participate in the study. A total of 300 women were addressed, of whom 238 (79%) met the criteria and completed a questionnaire. Data collection took place between 1 July 2021 and 4 October 2022.

The data collection was carried out as part of the international INTERSECT project. This article reports data collected in the Czech Republic only.

The study was approved by the Ethics Committee of the Faculty of Medicine, University of Ostrava (no. 15/2021). Informed consent was included in the questionnaire. Participation in the study was anonymous and voluntary, and participants could withdraw from the study at any time.

### Data collection

Data were collected using a Czech version (Dušová and Sikořová, 2021) of the standardized City Birth Trauma Scale (CityBiTS) (Ayers et al., 2018). The scale identifies a woman's potential traumatic experiences during or after her last childbirth. It contains 29 questions (Q1 to Q29) that cover the diagnostic criteria for PTSD according to the DSM-5 (Raboch et al., 2015). The respondent answers yes/no to the initial two questions regarding concerns about herself or her baby being seriously injured or dying during childbirth. By answering yes to Q1 and Q2, the woman meets DSM-5 Criterion A. The next 22 questions relate to the occurrence of intrusive symptoms, avoidance, negative changes in mood and cognition, and changes in reactivity and arousal in the last week. Symptoms are divided into those related to childbirth and those that began or worsened after childbirth. The respondent indicates the frequency of these symptoms during the last week on a graded scale: *not at all* (scored 0), *once* (1), *two to four times* (2), and *five or more times* (3). The following two questions ask about the time of onset and duration of childbirth-related symptoms (if symptoms were reported). The total score ranges from 0 to 60, calculated from Q3 to Q22 inclusive, and the higher the score, the more severe the PTSD symptoms. Instead of PTSD symptoms, Q23 and Q24 focus on symptoms of dissociation during childbirth rather than the phenomenon itself. The last three questions ask how these symptoms affect the respondent in her daily life and whether her symptoms could be related to substance use or physical illness; thus, Q29 serves as a criterion to exclude the diagnosis of PTSD. Q3 to Q24 are grouped into five subscales: (i) re-experiencing (Q3 to Q7), (ii) avoidance (Q8 and Q9), negative cognitions and mood (Q10 to Q16), hyperarousal (Q17 to Q22), and dissociative symptoms during childbirth (Q23 and Q24). Subscores are calculated by averaging all questions in each subscale.

The questionnaire was supplemented with sociodemographic and clinical questions to determine maternal age, ed-

ucation, presence of a birth support person, type of delivery, and gestational week at the time of childbirth.

### Statistical analysis

Data were processed using the statistical software Stata 17. Descriptive statistics – absolute frequency (*N*), relative frequency (%), mean, and standard deviation (*s*) – were used for basic data analysis. The difference between groups was tested using the Mann–Whitney and Kruskal–Wallis tests. The level of statistical significance was set at 5%.

## Results

All age groups were represented in the sample, with most women having tertiary education. Most participants had a natural vaginal delivery between 38 and 40 weeks of gestation (Table 1).

**Table 1. Demographic and clinical characteristics of the sample (*n* = 238)**

Demographic data	<i>N</i>	%	Clinical data	<i>N</i>	%
Age			Type of delivery		
<30 years	99	41.6	Vaginal	150	63.0
30–39 years	131	55.0	Vacuum extraction	13	5.5
≥40 years	4	1.7	Emergency cesarean	39	16.4
No answer	4	1.7	Planned cesarean	35	14.7
			No answer	1	0.4
Education			Gestational week		
Primary	15	6.3	<38	32	13.4
Secondary	107	45.0	38–39	136	57.1
Tertiary	115	48.3	≥40	62	26.1
No answer	1	0.4	No answer	8	3.4

Note: *N* – absolute frequency, % – relative frequency.

The mean CityBiTS total score suggests that the participants in our sample only experienced postpartum PTSD symptoms to a small extent. As many as 59 participants (24.79%) achieved a CityBiTS total score of 0 (no trauma). The highest total score reported was 40 points (one woman; 0.42%), and the second highest was 39 points (one woman). Only four women (1.68%) had a total score greater than 30 points.

The results for each question and subscale are shown in Table 2. The most intensely experienced symptoms were those belonging to the hyperarousal subscale, especially feelings of nervousness, tension, irritability, and aggression. With regard to the re-experiencing subscale, participants most often struggled with flashbacks to and recurrent unwanted memories of the childbirth and reliving the experience. Symptoms of the avoidance subscale were the least commonly reported.

### Assessing the prevalence of birth trauma in women

The CityBiTS results showed that two participants (0.8%) could be diagnosed with postpartum PTSD meeting the established criteria. One woman (0.4%) had delayed-onset PTSD. Another 22 women (9.3%) developed PTSD with dissociative symptoms. This means that 25 (10.5%) of the 238 participants may have suffered from some form of postpartum PTSD, based on the analysis of the CityBiTS results. However, these diagnoses can only be confirmed by a specialist through a diagnostic interview. The results are presented in Table 3.

**Table 2. Scores on components of the City Birth Trauma Scale**

	Yes	No
Q1. Did you believe you or your baby would be seriously injured?	31	207
Q2. Did you believe you or your baby would die?	10	228
<b>Subscales</b>	<b>Mean</b>	<b>SD</b>
<b>Re-experiencing symptoms</b>	<b>0.38</b>	<b>0.54</b>
Q3. Recurrent unwanted memories of the birth (or parts of the birth) that you can't control	0.51	0.82
Q4. Bad dreams or nightmares about the birth (or related to the birth)	0.22	0.57
Q5. Flashbacks to the birth and/or reliving the experience	0.57	0.84
Q6. Getting upset when reminded of the birth	0.33	0.67
Q7. Feeling tense or anxious when reminded of the birth	0.27	0.65
<b>Avoidance symptoms</b>	<b>0.17</b>	<b>0.49</b>
Q8. Trying to avoid thinking about the birth	0.20	0.59
Q9. Trying to avoid things that remind me of the birth (e.g., people, places, TV programs)	0.13	0.49
<b>Negative cognitions and mood</b>	<b>0.29</b>	<b>0.43</b>
Q10. Not able to remember details of the birth	0.22	0.59
Q11. Blaming myself or others for what happened during the birth	0.23	0.58
Q12. Feeling strong negative emotions about the birth (e.g., fear, anger, shame)	0.33	0.72
Q13. Feeling negative about myself or thinking something awful will happen	0.36	0.73
Q14. Lost interest in activities that were important to me	0.31	0.71
Q15. Feeling detached from other people	0.31	0.74
Q16. Not able to feel positive emotions (e.g., happy, excited)	0.27	0.68
<b>Hyperarousal</b>	<b>0.40</b>	<b>0.51</b>
Q17. Feeling irritable or aggressive	0.58	0.84
Q18. Feeling self-destructive or acting recklessly	0.11	0.45
Q19. Feelings tense and on edge	0.73	0.93
Q20. Feeling jumpy or easily startled	0.50	0.85
Q21. Problems concentrating	0.34	0.70
Q22. Not sleeping well because of things that are not due to the baby's sleep pattern	0.14	0.51
<b>Dissociative symptoms during the birth</b>	<b>0.13</b>	<b>0.47</b>
Q23. Feeling detached or as if you are in a dream	0.13	0.48
Q24. Feeling things are distorted or not real	0.13	0.46
<b>Others</b>		
Q25. When did these symptoms start?	0.46	0.51
Q26. How long have these symptoms lasted?	0.28	0.49
Q27. Do these symptoms cause you a lot of distress?	0.22	0.67
Q28. Do they prevent you [from] doing things you usually do (e.g., socializing, daily activities)?	0.21	0.64
Q29. Could any of these symptoms be due to medication, alcohol, drugs, or physical illness	0.01	0.10
<b>City Birth Trauma Scale total score</b>	<b>6.60</b>	<b>7.76</b>

Note: SD – standard deviation, mean – mean score values.

**Table 3. Participants with a possible diagnosis of PTSD**

Post-traumatic stress disorder	City Birth Trauma Scale – CityBiTS	
	N	%
PTSD according to the criteria	2	0.8
Delayed-onset PTSD	1	0.4
PTSD with dissociative symptoms	22	9.3
Total	25	10.5

Note: N – absolute frequency, % – relative frequency.

### **Effect of the presence of a birth support person on the development of birth trauma in women**

Most commonly, participants were accompanied by their partner during childbirth (185; 77.73%). Given the variety of responses to this question, the sample could not be further classified, so all supporters other than partners were combined into one group, as shown in Table 4. The question was answered by a total of 232 participants (97.47%). There was a statistically significant difference ( $p = 0.044$ ) in the group of participants analyzed. Statistically significantly more women (mean = 6.16; SD = 7.57) had a lower mean CityBiTS total score when accompanied by their partner than those accompanied by other or no support persons (mean = 8.80; SD = 8.69).

**Table 4. City Birth Trauma Scale total score by the presence of a birth support person**

Birth support person	Mean	Median	SD	Min	Max	$p$
Partner	6.16	3.0	7.57	0	40	<b>0.044</b>
Other or none	8.80	5.5	8.69	0	32	

Note: SD – standard deviation, mean – mean score values,  $p$  – statistical significance  $\alpha = 0.05$ .

Women accompanied by their partner have a lower risk of developing birth trauma than those with other or no birth support persons.

### **Effect of gestational week at childbirth on the development of birth trauma in women**

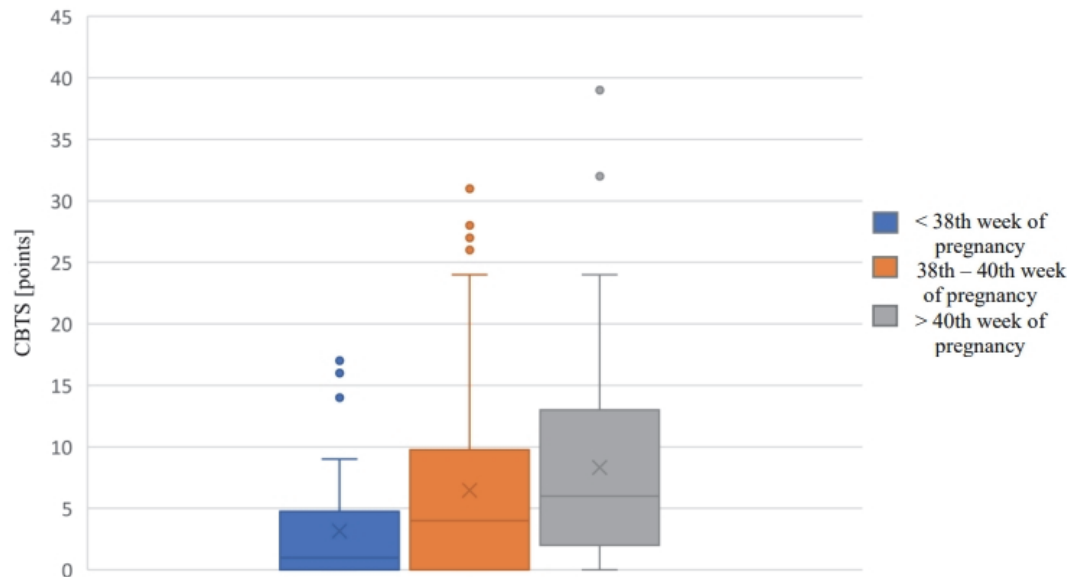
Women who delivered after 40 weeks of pregnancy had the highest mean CityBiTS total score. There was a statistically significant difference between groups of women by gestational week at childbirth ( $p = 0.001$ ). Participants giving birth after 40 weeks' gestation had higher total scores (mean = 8.32; SD = 8.28) than those with term deliveries (mean = 6.47; SD = 7.51) or those giving birth before gestational week 38 (mean = 3.16; SD = 4.82), suggesting that late-term delivery predisposes to birth trauma. These findings are shown in Chart 1.

### **Other factors analyzed**

Other factors (age and education) were not found to be statistically significant. The highest mean CityBiTS total score was found in women younger than 30 years of age (mean = 7.20; SD = 8.602). However, the difference between the age groups was not statistically significant ( $p = 0.563$ ). When education was assessed, the highest total score was observed in women with primary education (mean = 9.67; SD = 8.71); once again, the difference was not statistically significant ( $p = 0.093$ ).

The final factor studied was the type of delivery. There was no statistically significant difference between the subgroups ( $p = 0.173$ ). The highest total scores were noted for vacuum

extraction delivery (mean = 12.85; SD = 12.55) and planned cesarean section (mean = 8.40; SD = 10.42).



**Chart 1.** City Birth Trauma Scale total score by gestational week at childbirth

## Discussion

The study aimed to assess birth trauma and the factors that influence it using the CityBiTS, a tool that has been validated in many languages, including Turkish (Bayrı Bingöl et al., 2020), Spanish (Caparros-Gonzalez et al., 2021), French (Sandoz et al., 2022), Italian (Di Gesto et al., 2024), and German (Weigl et al., 2021). This allows comparison of results from different countries.

Early detection of birth trauma in women is important to ensure subsequent help. Research has confirmed the link between birth trauma and postpartum depression (Dekel et al., 2020; Ďuričková et al., 2023a; Liu et al., 2021). For this reason, women with birth trauma should receive adequate psychological care.

The present study identified nearly 11% of participants with some form of postpartum PTSD. These women should undergo further psychological testing. Harrison et al. (2021) reported postpartum PTSD in approximately 2.5% of women in the United Kingdom, with a further 6.8% showing symptoms of postpartum PTSD due to younger age, antenatal depression, or a medical history that affected their pregnancy. A meta-analysis by Grekin and O'Hara (2014) showed that approximately 3.2% of women in the United States develop postpartum PTSD. In high-risk groups, the prevalence was as high as 15.7%. Ďuričková et al. (2023a) found PTSD symptoms in 2.8% of Slovak women.

An important finding of our study is that the presence of a birth support person influences the risk of developing birth trauma. Women accompanied by their partner had a lower risk of birth trauma than those accompanied by other or no support persons. Handelzalts et al. (2022) reported an even greater benefit for laboring women who were accompanied by at least one additional person besides their partner. Those

with only their partner present had more symptoms associated with postpartum PTSD than those supported by two or more people. The other studies did not address this factor.

Another factor studied was gestational week at the time of childbirth. While some authors claim that giving birth earlier in pregnancy is a risk factor for birth trauma (McKenzie-McHarg et al., 2015; Modarres et al., 2012; Stén et al., 2023), in our study, post-term childbirths were more likely to be associated with birth trauma.

The present study failed to confirm age and education as predictors of postpartum PTSD. Ozcalik and Aksoy (2024) reported higher CityBiTS scores in women aged 31 to 44 years. Although we found a higher mean score in participants younger than 30 years, the result was not statistically significant. Ozcalik and Aksoy (2024) also demonstrated the effect of education, with more educated women having more positive memories of childbirth.

Another risk factor identified in previous studies is the type of delivery. Nakić Radoš et al. (2020) and Stén et al. (2023) found that women who underwent instrumental vaginal delivery or emergency cesarean section had significantly higher CityBiTS total scores compared to those with vaginal delivery or planned cesarean. Thus, women with instrumental vaginal delivery or emergency cesarean were more likely to develop PTSD (Ayers et al., 2016; Dekel et al., 2017; Stén et al., 2023). This was not the case in either our study or in a study by Ďuričková et al. (2023b).

The limitations of our study are data collection in only five gynecology centers in the Moravian-Silesian Region and thus a relatively small number of participants. However, the enrolled women did not give birth in a single hospital. The catchment area includes four hospitals: the University Hospital Ostrava, Agel Vítkovice Hospital, Ostrava City Hospital, and Havířov Hospital. The purposive sampling method was used to enroll women who visited the selected gynecology centers over the



defined period of time. Data were collected as part of the international INTERSECT project, with findings from other countries being analyzed and published separately.

Further research should focus on other factors that may influence the development of postpartum PTSD (e.g., previous depression before or during pregnancy, or socioeconomic status). We also recommend additional psychological testing of women identified as having some form of PTSD using the CityBiTS, and determining the proportion of women actually diagnosed by a psychologist.

## Conclusion

Birth trauma in Czech women has not yet received sufficient attention. It is advisable to open a discussion on this topic both among professionals (doctors, midwives, psychologists) and with women and their partners who may be negatively affected by birth trauma in all areas of their lives in the long term. Preventive measures should involve screening pregnant women for risk factors during antenatal visits and, based on the screening results, developing an individual care plan for the pregnant woman to minimize the risk or completely prevent the development of birth trauma and related complications. It is also desirable to educate midwives and other staff members in hospital postpartum units about the manifestations of birth trauma so that it can be identified at an early stage. The sooner the woman is referred for professional help, the lower the risk of long-term problems, both psychological and affecting her private and social life.

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## Ethical aspects and conflict of interest

The authors have no conflict of interest to declare.

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