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Full Length Article

Birth satisfaction and symptoms of childbirth related PTSD among women in Iceland: A population-based study

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ABSTRACT

Background: Given its complexity, childbirth can elicit both positive and negative psychological reactions and, in some cases, women may experience symptoms of childbirth-related post-traumatic stress disorder (CB-PTSD). Several risk factors for CB-PTSD have been identified previously, including history of mental health issues and childbirth related complications. The aim of our study was to explore the role of satisfaction with care in CB-PTSD symptoms.

Methods: CB-PTSD was measured with the City Birth Trauma Scale (CityBiTS), a questionnaire with 29 items distributed according to DSM-5 diagnostic criteria. A CityBiTS score >28 points was defined as CB-PTSD symptoms. Birth satisfaction was measured with the Birth Satisfaction Scale-Revised (BSS-R), a self-report questionnaire. Logistic-regression was used to calculate odds ratios and 95 % confidence intervals for the association between birth satisfaction and CB-PTSD, adjusted for age, relationship status, education, income, parity, mode of birth, postpartum depression and maternal and infant health-related problems during pregnancy and birth.

Results: Of 600 participants, 34 (5.7 %) indicated symptoms of CB-PTSD. When adjusted for socio-demographic and pregnancy and birth-related factors, birth satisfaction was independently associated with symptoms of CB-PTSD. For each additional point on the BSS-R, the odds of having CB-PTSD symptoms decreased by 16%. Support during labor and birth, effective communication and shared decision making were factors significantly associated with CB-PTSD symptoms.

Discussion: Increased satisfaction with care was strongly associated with less symptoms of CB-PTSD. Emphasizing sense of control with support, effective communication and shared decision making may significantly improve the overall experience for women and possibly reduce CB-PTSD symptoms.

Introduction

Given its complexity, childbirth can elicit both positive and negative psychological reactions and, in some cases, birth can be a significant traumatic experience that results in a post-traumatic stress response for the mother. The overall prevalence of childbirth-related Post Traumatic Stress Disorder (CB-PTSD) varies across studies and countries. In two systematic reviews the prevalence was between 3.0–6.0 % in community samples and 15.7–18.5 % in high-risk groups [1,2]. In a third systematic review, which did not differentiate into community and high-risk samples, the prevalence was estimated to range between 2.8–5.6 % around six weeks postpartum to approximately 1.5 % six months postpartum [3].

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) PTSD is referred to as a reaction to events the individual is exposed to, that constitute either “actual or threatened death or serious injury, or a threat to the physical integrity of self or others” [4]. Originally, measurement tools for PTSD were developed to detect psychological distress after disasters such as war or accidents. For CB-PTSD symptoms specifically, three questionnaires have been developed. These

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include the Traumatic Event Scale [5], the Perinatal PTSD Questionnaire [6,7] and the City Birth Trauma Scale (CityBiTS) [8]. CityBiTS is the only questionnaire specifically designed to measure CB-PTSD according to all DSM-5 diagnostic criteria.

In the DSM-5, PTSD symptoms are classified into four clusters; intrusions, avoidance of trauma-related stimuli, alterations in mood and cognitions, and alterations in arousal and reactivity [4]. While accidents, wars, or natural disasters represent well-known traumatic stressors, childbirth may also meet DSM criteria for a traumatic event [6]. However, only a small part of women who perceive their birth as traumatic will have symptoms of postpartum PTSD. Fear is a normal response during and after a traumatic event, but most women will recover from the initial fear-related symptoms naturally and not develop CB-PTSD [9]. Furthermore, it is important to note that women who did not perceive their birth as traumatic could also develop postpartum PTSD later on [3,10]. The etiology of CB-PTSD is therefore often complex.

Previous research has identified a number of risk factors of CB-PTSD involving a history of mental health issues, fear of childbirth, complications during pregnancy or childbirth, negative subjective birth experiences, operative birth, lack of support, poor coping and stress, and poor feeling/perception of support [6]. Recent studies have also shown that satisfaction with birth experience might also be inversely related to PTSD symptoms [11,12]. One dimension of birth satisfaction is how women perceive the quality of their care during labor and birth. To the best of our knowledge, this has not been studied in the Nordic context. Therefore, the aim of our study was to explore the role of satisfaction with care during labor and birth and symptoms of CB-PTSD. Our primary objective was to assess the association between birth satisfaction and symptoms of CB-PTSD and our secondary objective was to assess whether sociodemographic or birth-related factors were associated with symptoms of CB-PTSD. A deeper understanding of the mechanisms linking birth satisfaction and CB-PTSD could inform clinical practice, specifically regarding providing care for women showing symptoms of CB-PTSD.

Methods

Study setting

In Iceland, the healthcare system is financed by the Ministry of Health and birth services are free of charge for all women who have Icelandic health insurance. Maternity care is generally provided by midwives in collaboration with obstetricians, when indicated. Most births in the country occur at the National University Hospital (74 % of all births in 2020) [13]. In home, postpartum care is provided by midwives for the first ten days after birth and nurses at local healthcare clinics provide well-baby care for the family once the baby reaches two weeks of age. At nine weeks postpartum, women are offered a screening for postpartum depression and an appointment with a midwife to discuss the birth experience is also available at the local healthcare clinics [14].

Design and study population

Data was collected as part of an international cross-sectional study, INTERSECT, a survey of childbirth-related trauma in collaboration with researchers worldwide. INTERSECT aims to determine the prevalence of birth trauma and PTSD and differences in symptom presentation across countries and cultures. Our study describes the Icelandic data which was collected in Iceland as part of the international INTERSECT study.

The Icelandic study was a population-based study using the INTERSECT survey to collect data from all women who had given birth to a live child or children in Iceland from March 14th to July 31st, 2022. An invitation to participate was sent via email six to twelve weeks after women had given birth, and a reminder email was sent a week later. Data was collected from May 30th to September 19th, 2022. The survey was made available in Icelandic and English and sent to 1458 women. Participants were excluded if they had not answered the main outcome variable (CB-PTSD symptoms assessed with the CityBiTs Trauma Scale) or questions about socio-demographic background and birth satisfaction. About 63 % (924 women) of the those that received invitation to participate, participated in the study and a total of 600 women were in included the final study sample (Fig. 1).

Measurements

CB-PTSD symptoms

The outcome variable was symptoms of CB-PTSD, measured the City Birth Trauma Scale (CityBiTS). CityBiTS is a questionnaire with 29 items distributed according to DSM-5 diagnostic criteria and to our knowledge the only scale that measures symptoms of CB-PTSD according to DSM-5 [7]. It has a two-factor structure, which is represented by birth related symptoms and general symptoms. Studies have shown that the English version of the scale has good reliability and indication of reasonable validity [8]. It has also presented satisfactory internal consistency, convergent, divergent and discriminant validity [8,15]. The CityBiTS has been translated and validated to other languages, e.g., French [16], German [17], Turkish [18], Croatian [19] and Spanish [20] and shown good reliability across languages. The questionnaire was translated to

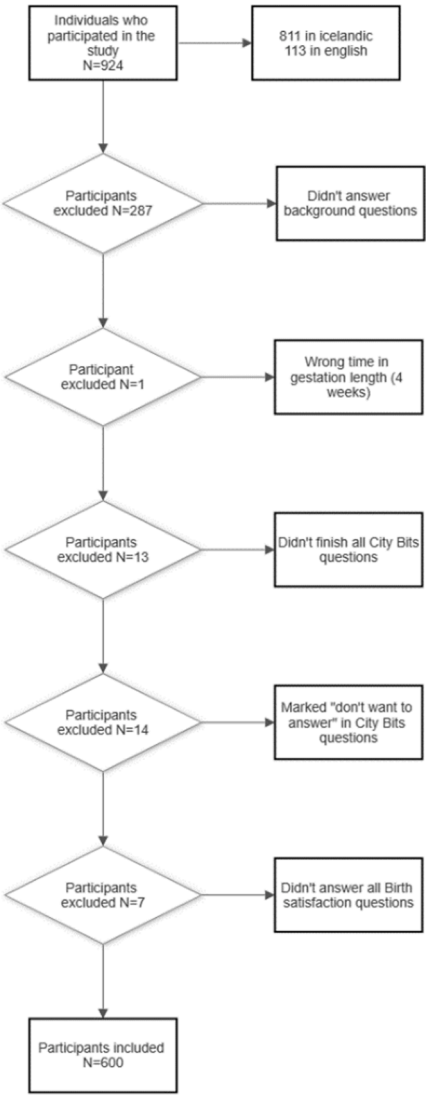

Fig. 1. This flowchart shows the exclusion criteria and number of excluded participants in our study.

Icelandic using forward and back translation but has not yet been validated in Icelandic.

The first two questions in the questionnaire (criterion A) measured exposure to traumatic stressors such as whether the participant thought that she or the baby would be seriously harmed or die (yes/no). The next five questions addressed symptom frequency of intrusions (criterion B), such as nightmares about the birth, re-experience and getting upset when reminded about the birth. Criterion C included two questions about whether participants avoided thinking about the birth or avoided things that reminded them of the birth. Criterion D measured negative cognitions and mood and included seven questions, such as feeling negative about themselves or thinking that something awful will happen. Criterion E included six questions about hyperarousal and two questions about symptoms of derealization and depersonalization (PTSD dissociative subtype). All questions in criterion B-E were on a 4-point Likert-scale, with a higher number indicating a higher frequency. The last five questions assessed the onset of the symptoms (0 = before birth, 1 = less than 6 months after birth, 2 = more than six months), duration of the symptoms (0 = less than one month, 1 = 1–3 months, 2 = more than 3 months), if the symptoms distressed and interfered with daily life (0 = no, 1 = sometimes, 2 = yes) and if there might be other reasons for the symptoms, such as medication, drugs, alcohol or physical illness (0 = no,1 = maybe, 2 = yes). The total score ranged from 0 to 60 in criterion B-E, and a higher score suggests greater severity of PTSD symptoms [16]. De Lima Osório et al. (2022) were first to establish the appropriate cut-off score for CB-PTSD, which was >28 for criterion B-E, and we chose to use this cut-off score in our study to describe participants with symptoms of CB-PTSD [15].

Birth satisfaction

Birth satisfaction was measured with the Birth Satisfaction Scale-Revised (BSS-R). The BSS-R is a self-report questionnaire which measures satisfaction with labor and delivery in three categories: quality of care provision, personal attributes and stress experiences during labor [21]. The BSS-R was translated to Icelandic as part of the INTERSECT study. The questionnaire has not been validated in Icelandic but has shown good reliability when translated to other languages [22–24]. BSS-R is a short form version of the original scale with ten questions [25]. All response options were on a 5-point Likert scale, based on agreement with the statements in the questions. The score was 0–4, and the total score ranges from 0 to 40, where the lower score represented less birth satisfaction. There is no established cut-off score for BSS-R [25] but similar to previous studies, we report on the total score for the BSS-R [26].

Exposure variables

The exposure variables were socio-demographic and birth-related factors, symptoms of depression and anxiety, birth satisfaction and health-related factors for mother and infant. Socio-demographic factors were age (≤20 years, 21–25 years, 26–30 years, 31–35 years, 36–40 years and ≥ 41 years), residence (rural, village without maternity services, town with maternity services and urban), relationship status (married or in registered cohabitation, living with a partner, in a relationship but not living together, single, and other), ethnicity (majority (e.g., Caucasian Icelander), minority or not sure), country of birth, education (no formal education or just elementary school, high school, and higher education), and income (higher than average, average and lower than average), whether they had ever been diagnosed with a mental health issue (yes, no, don't know) or if they had a current psychological or mental health issue (yes, no, don't know).

Participants were also asked about pregnancy and birth related information, such as parity (primipara, multipara), previous birth trauma (yes, no), previous pregnancy loss (yes, no), number of infants in last birth (1, 2, ≥3), place of birth (hospitals; rural clinics, birth centers or homebirth; other), mode of birth (vaginal birth, instrumental birth, elective or emergency cesarean-section) and gestational length in weeks (≤36, 37–41, or ≥42), whether they had any health related issues during pregnancy or birth (yes minor, yes major, no) or whether their baby had any health related issues during pregnancy or birth (yes minor, yes major, no). Participants were also asked four questions to assess incidence and frequency of feelings indicating depression, anxiety, worry, lack of enjoyment and/or stress during pregnancy (see Table 2). Symptoms of postpartum depression were furthermore assessed with the Edinburgh Postnatal Depression scale (EPDS) with a total score range from 0 to 30, with a higher score suggesting postpartum depression. The cut of score for symptoms of postpartum depression was 11 points or more on the EPDS scale.

Data analysis

Exposure variables were described as number and percentage (%) of the study sample. The total score of CityBiTS (criterion B-E) was calculated, as well as min, max, and mean values. In line with previous research, a CityBiTS score over 28 points was defined as having symptoms of CB-PTSD [15]. The association between exposure variables and a CityBiTS score higher than 28 points was calculated, and then Fischer's exact test was used to test the association with 95 % confidence intervals. The number of answers to every question in BSS-R was calculated and described as number and percentage (%) of the study sample and the total score of BSS-R was calculated, as well as min, max and mean values. Mann Whitney *U* test (Wilcoxon rank sum test) was used for the association between total BSS-R score and CityBiTS score. Health related variables were described as number and percentage (%) of the study sample and Fischer's exact test was used to test the association with 95 % confidence intervals between those variables and CityBiTS score. Odds ratios and 95 % confidence intervals are reported for the association between birth satisfaction (BSS-R) and symptoms of CB-PTSD (CityBiTS) among the study participants. The logistic regression model was adjusted for age, relationship status, education, income, parity, mode of birth, EDPS and maternal and infant health-related problems during pregnancy and birth. All statistical analysis was performed in R-Studio.

The study was approved by the National Bioethics Committee in Iceland (VSN-21-237) as well as the Bioethics Committee of the Primary Health Care Center of the Capital Area and the University of Iceland.

Results

Of 600 participants, 34 (5.7 %) scored higher than 28 points on the CityBiTS indicating symptoms of CB-PTSD (Fig. 2). The lowest value was 0 points and the highest 51 point.

The majority of participants in this study lived in urban areas (74.5 %), were married or co-habiting (77.0 %) and considered themselves part of a majority ethnicity group in Iceland (95.3 %; Table 1). Nearly 38 % of the participants had a previous mental or psychological diagnosis and 22 % had a current diagnosis. Both were significantly associated to symptoms of CB-PTSD ($p < 0.001$; Table 1). There was no significant difference in symptoms of CB-PTSD among the groups in terms of age, residence, and ethnicity (Table 1). However, participants who were single were more likely to show symptoms of CB-PTSD compared to those who were in a relationship ($p < 0.05$; Table 1).

The majority of participants gave birth in a hospital setting (90.9 %), had a vaginal birth (78.2 %) and gave birth between 37–41 weeks (92.7 %, Table 2). Mode of birth and primiparity were both significantly associated with higher rates of symptoms of CB-PTSD ($p = 0.002$ and $p < 0.001$, respectively; Table 2). Regarding mode of birth, the highest percentage of CB-PTSD symptoms was found among those who gave birth via emergency cesarean section (18.4 %), then instrumental birth (7.8 %) and vaginal birth (4.3 %). Symptoms of CB-PTSD were lowest among those who had an elective cesarean section (3.8 %). While 34.4 % of multiparous participants had experienced a previous birth as a traumatic event, this was not significantly associated with current CB-PTSD

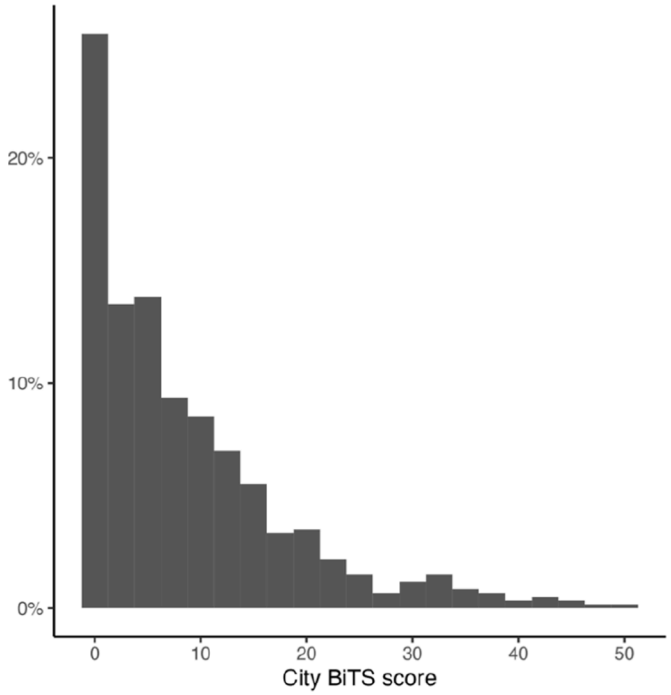

Fig. 2. Proportions of CityBiTS scores among the study participants (N = 600). A higher score on the CityBiTS scale indicates more symptoms of CB-PTSD.

symptoms (Table 2). Changes to mental health during pregnancy were significantly associated with CB-PTSD. Across all four categories, with increased frequency of depression, anxiety, worries or lack of enjoyment, the likelihood of experiencing CB-PTSD symptoms postpartum were significantly increased ($p < 0.001$, Table 2).

In the EPDS questionnaire, 17.3 % scored more than 11 points and were therefore considered to have symptoms of postpartum depression (Table 2). They were also more likely to have symptoms of CB-PTSD compared to those scoring lower than 11 points on the EPDS scale ($p < 0.001$; Table 2). Health-related problems that had affected the mother during pregnancy or birth were significantly associated with symptoms of CB-PTSD ($p < 0.05$ %) but not health-related problems concerning the infant ($p = 0133$; Table 2).

The lowest birth satisfaction scale score was 8 points, the highest was 40 and the mean score was 29.9 points (Fig. 3). All items on the BSS-R scale were significantly associated with symptoms of CB-PTSD except for the one regarding cleanliness of the birthing room (Table 3). When birth satisfaction scale scoreswere grouped together, participants who scored 0–20 points where significantly more likely to show symptoms of CB-PTSD (28.1 %) compared to those who scored 21–30 points (6.2 %) and those who scored 31–40 points (0.7 %; $p < 0.001$), indicating a dose response. Fig. 4 shows a boxplot of birth satisfaction scale scores with those who had symptoms of CB-PTSD (to the right) and those who had not (left). This difference was significant ($p < 0.001$). When adjusted for socio-demographic and pregnancy and birth-related factors, birth satisfaction was independently associated with symptoms of CB-PTSD (Table 4). For each additional point on the birth satisfaction scale, the odds of having CB-PTSD symptoms decreased by about 16 % (Table 4).

Table 1
Demographic characteristics and their association with symptoms of CB-PTSD among women in Iceland (N = 600).

			CB-PTSD (CityBiTS > 28)		p-value*
	n	%	n	%	
Age					0.401
≤20	7	1.2	1	14.3	
21–25	64	10.7	6	9.4	
26–30	205	34.2	10	4.9	
31–35	208	34.7	10	4.8	
36–40	100	16.7	7	7.0	
≥41	16	2.7	0	0.0	
Residence					0.893
Urban	447	74.5	28	6.3	
Town	69	11.5	3	4.3	
Village	58	9.7	2	3.4	
Rural	26	4.3	1	3.8	
Relationship status					0.042
Married/Registered cohabitation	462	77.0	23	4.9	
Cohabitation	101	16.8	5	4.9	
Relationship	6	1.0	0	0.0	
Single	30	5.0	6	20.0	
Other	1	0.2	0	0.0	
Ethnicity					0.812
Majority group in current country	572	95.3	33	5.8	
Minority group in current country	15	2.5	1	6.7	
Not sure	13	2.2	0	0.0	
Country of birth					1
Lives in country of birth	510	85.0	29	5.7	
Lives not in country of birth	90	15.0	5	5.6	
Education					0.372
No formal/Elementary school	49	8.2	3	6.1	
High school	130	21.7	11	8.5	
Higher education	421	70.2	20	4.8	
Income					0.673
Lower than average	86	14.3	6	7.0	
Average	396	66.0	23	5.8	
Higher than average	118	19.7	5	4.2	
Diagnosis of psychological or mental issues (ever)					<0.001
Yes	233	38.8	27	11.6	
No	353	58.8	6	1.7	
Don't know	14	2.3	1	7.1	
Current psychological or mental health issues					<0.001
Yes	132	22.0	24	18.2	
No	406	67.7	3	0.7	
Don't know	62	10.3	7	11.3	

* We used Fischer's test to assess the statistical difference between outcome and exposure.

Discussion

Our study is the first to report on the prevalence of CB-PTSD symptoms among women in Iceland measured with the newly developed CityBiTS scale, the only instrument that is designed specifically to assess CB-PTSD symptoms. Our results indicated that 5.7 % of women had symptoms of CB-PTSD. Factors that were associated with experiencing CB-PTSD symptoms were being single, primiparity, emergency cesarean-section, lower birth satisfaction, history of psychiatric disorders, depression and anxiety symptoms before and during pregnancy and maternal health related problems during pregnancy and birth.

Our finding is consistent with results from an earlier systematic review and meta-analysis reporting an overall mean prevalence of CB-PTSD from 5.44 % to 5.9 % [2]. Similarly, a previous Icelandic study found that 5–6 % of women described their birth as a negative experience [27]. Interestingly, in studies using the CityBiTS instrument, the prevalence of symptoms of CB-PTSD varies depending on cultural environment. For example, in Brazil, the prevalence was 36.4 %, using the same cut of score [15]. In Germany, 2.6 % fulfilled all criteria to qualify for a PTSD diagnosis according to DSM-5 [17], but 7.1 % in

Table 2
Pregnancy and birth related factors and their association with symptoms of CB-PTSD among women in Iceland (N = 600).

	n	%	CB-PTSD (CityBiTS > 28)		p-value*
			n	%	
Parity					**<0.001**
Multipara	331	55.2	9	2.7	
Primipara	269	44.8	25	9.3	
Previous birth trauma					0.5
Yes	114	34.4**	4	3.5	
No	217	65.6	5	2.3	
NA (no previous children)	269		NA	NA	
Previous pregnancy loss					0.4
Yes	184	30.7	8	4.3	
No	416	69.3	26	6.3	
Number of infants in last birth					1
One	594	99.0	34	6.1	
Twins	3	0.5	0	0.0	
≥2	2	0.3	0	0.0	
NA	1	0.2	0	0.0	
Place of birth***					0.93
Hospital	546	90.9	33	6.0	
Birth center, rural clinics and homebirth	37	6.2	0	0	
Other	17	2.8	1	5.9	
Mode of birth					**0.002**
Vaginal birth	469	78.2	20	4.3	
Instrumental birth	51	8.5	4	7.8	
Emergency cesarean-section	49	8.2	9	18.4	
Elective cesarean-section	26	4.3	1	3.8	
NA	5	0.8	0	0.0	
Gestational length					0.06
≤36 weeks	30	5.0	3	10.0	
37–41 week	556	92.7	29	5.2	
≥42 weeks	15	2.5	2	13.3	
Did your feelings change during pregnancy, so you felt down, depressed, or hopeless?					**<0.001**
Not at all	269	44.8	3	1.1	
Few days	268	44.7	19	7.1	
More than half the time	53	8.8	10	18.9	
Daily	10	1.7	2	20.0	
Did you feel a lack of interest, or that you did not enjoy doing things during pregnancy?					**<0.001**
Not at all	281	46.8	7	2.5	
Few days	241	40.2	77	32.0	
More than half the time	64	10.7	14	28.0	
Daily	14	2.3	2	16.7	
Did you feel anxious, nervous, or stressed during pregnancy?					**<0.001**
Not at all	238	39.7	3	1.3	
Few days	259	43.2	10	3.9	
More than half the time	84	14.0	16	19.1	
Daily	13	2.2	5	38.5	
NA	3	0.5	0	0.0	
Did you feel like you could not stop worrying or could not control worries during pregnancy?					**<0.001**
Not at all	298	49.8	3	1.0	
Few days	203	33.8	14	6.9	
More than half the time	76	12.7	11	14.5	
Daily	21	3.5	6	28.6	
NA	2	0.3	0	0.0	
Depression measured postpartum with the EDPS scale					
<11 points	495	82.5	22	4.4	**<0.001**
≥11 points	104	17.3	26	25.0	
NA	1	0.2			
Maternal health-related problems during pregnancy and birth					**0.043**
No	271	45.2	11	4.1	
Yes, minor	275	45.8	16	5.8	
Yes, major	54	9.0	7	13.0	
Infant health-related problems during pregnancy and birth					0.133
No	514	85.7	28	5.5	
Yes, minor	66	11.0	3	4.6	
Yes, major	19	3.2	3	15.8	
NA	1	0.2	0	0.0	

* We used Fischer' test to assess statistical difference between outcome and exposure.
** 34.4 % of those who had other children (331 participants).
*** Hospital: The National University Hospital of Iceland, The Healthcare Institution of North Iceland, The Healthcare Institution of West Iceland, The Healthcare Institution of the Westfjords, The Health Directorate of East Iceland; Rural clinic: Sudurnes Hospital and Health Center, The Healthcare Institution of South Iceland.

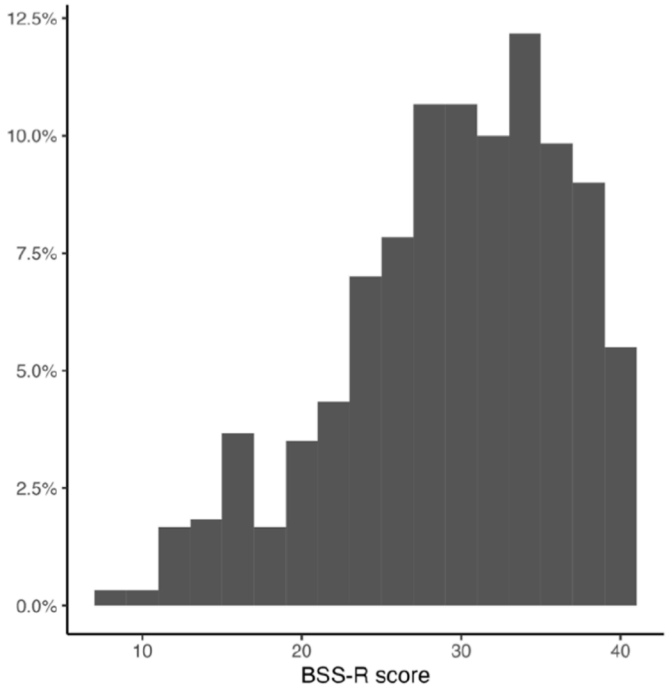

Fig. 3. Proportions of Birth Satisfaction Scale score (BSS-R) among the study participants (N = 600). A lower score represents lower birth satisfaction.

England [8] and in Sweden, the prevalence of CB-PTSD was 3.8 % [28]. This variance in prevalence may be due to cultural factors and differences in measurement, e.g., difference in calculations, different measurement time or difference in data collection, although the same questionnaire was used. This highlights the need to use the same measurement as well as similar ways of collecting data among countries and cultures. The INTERSECT study, which the authors of this study are part

Table 3
Birth satisfaction scale items and their association with symptoms of CB-PTSD among women in Iceland (N = 600).

	n	%	CB-PTSD*		p-value**
I gave birth almost unscathed			n	%	**<0.001**
Strongly disagree/disagree	80	13.3	17	21.3	
Neither agree nor disagree	60	10.0	5	8.3	
Agree/strongly agree	460	76.7	12	2.6	
I thought my labor was excessively long					0.02
Strongly agree/agree	112	18.7	9	8.0	
Neither agree nor disagree	99	16.5	10	10.1	
Disagree/strongly disagree	389	64.8	15	3.9	
The delivery room staff encouraged me to make decisions about how I wanted my birth to progress					**<0.001**
Strongly disagree/disagree	78	13.0	11	14.1	
Neither agree or disagree	125	20.8	10	8.0	
Agree/strongly agree	397	66.2	13	3.3	
I felt very anxious during my labor and birth					**<0.001**
Strongly agree/agree	130	21.7	17	13.1	
Neither agree or disagree	107	17.8	9	8.4	
Disagree/strongly disagree	363	60.5	8	2.2	
I felt well supported by staff during my labor and birth					**<0.001**
Strongly disagree/disagree	23	3.8	7	30.4	
Neither agree or disagree	29	4.8	6	20.7	
Agree/strongly agree	548	91.3	21	3.8	
The staff communicated well with me during labor					**<0.001**
Strongly disagree/disagree	24	4.0	8	33.3	
Neither agree or disagree	32	5.3	5	15.6	
Agree/strongly agree	544	90.7	21	3.9	
I found giving birth a distressing experience					**<0.001**
Strongly agree/agree	121	20.2	22	18.2	
Neither agree or disagree	86	14.3	5	5.8	
Disagree/strongly disagree	393	65.5	7	1.8	
I felt out of control during my birth experience					**<0.001**
Strongly agree/agree	151	25.2	26	17.2	
Neither agree or disagree	116	19.3	3	2.6	
Disagree/strongly disagree	333	55.5	5	1.5	
I was not distressed at all during labor					**<0.001**
Strongly disagree/disagree	129	21.5	21	16.3	
Neither agree or disagree	99	16.5	7	7.1	
Agree/strongly agree	372	62.0	6	1.6	
The delivery room was clean and hygienic					0.07
Strongly disagree/disagree	4	0.7	1	25.0	
Neither agree or disagree	17	2.8	2	11.8	
Agree/strongly agree	579	96.5	31	5.4	

* A score > 28 on CityBiTS was defined as symptoms of CB-PTSD.
** We used Fischer's test to assess the statistical difference between outcome and exposure.

of, will have an unprecedented opportunity to do exactly this. Over forty countries will contribute data collected with the same instrument, in the same way and during the same time frame (year 2022–2023). This will provide an opportunity to compare the incidence of CB-PTSD among women giving birth around the same time in forty countries around the world. International comparative data have yet to be published from the INTERSECT study.

We found no difference in the prevalence of CB-PTSD symptoms when stratified by socio-demographic background, except for relationship status and parity. Previous results differ on the role of parity in CB-PTSD [27,29] but have shown that social support during pregnancy and

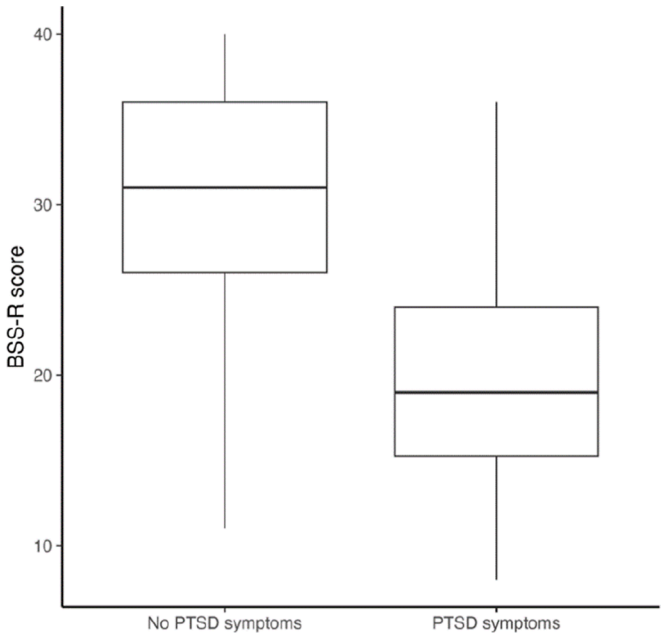

Fig. 4. A boxplot showing the association between birth satisfaction and symptoms of CB-PTSD among the study participants (N = 600).

Table 4
Odds ratios and 95 % confidence intervals for the association between birth satisfaction and symptoms of CB-PTSD among the study participants (N = 600).

Overall BSS-R	OR	95 % CI	p-value
Crude	0.81	0.77–0.86	<0.001
Adjusted[a]	0.84	0.77–0.91	<0.001

[a] Adjusted for age, relationship/marital status, parity, mode of birth, education, income, maternal complications during pregnancy and birth, infant complications during pregnancy and birth, and EPDS score.

the postpartum period is associated with less symptoms of CB-PTSD [30,31]. This could explain the difference found in relationship status, as support from a partner could also play an important role in whether women felt supported during pregnancy and birth [32]. Mode of birth was significantly associated with CB-PTSD. Giving birth via an emergency cesarean-section was associated with the highest rates of CB-PTSD symptoms, followed by instrumental birth and vaginal birth and this is consistent with previous studies [3,29,30]. The lowest rate of CB-PTSD symptoms was found among women with elective cesarean sections, which may indicate that sense of control may be a key mediating factor in terms of mode of birth, especially among women undergoing cesarean section [33].

The association between postpartum depression and CB-PTSD was an expected finding as this has been established previously in multiple studies [34–36]. Similarly, health-related concerns during pregnancy and birth were associated with CB-PTSD but, health risks related to the unborn child were not a statistically significant risk factor. This may very well be explained by low sample size. Among women with infant health related concerns during pregnancy, 15.8 % had symptoms of CB-PTSD compared to 5.5 % of women who had no health-related concerns regarding their infant. While this difference may not be statistically significant, it does warrant further exploration.

Satisfaction with care was significantly associated with increased risk of CB-PTSD symptoms. Previous studies using the same instruments to measure satisfaction and CB-PTSD symptoms have revealed the same results [12,37]. This may be explained by some of the attributes of the birth satisfaction scale being strongly related to DSM criteria for PTSD, such as sense of control [3], anxiety and stress. However, the extent to

which women felt supported by staff, how effectively communication occurred during labor and birth, and whether they felt empowered to make decisions about their care were also significantly associated with CB-PTSD. This has important implications for clinical practice. While it is impossible to control all aspects of labor and birth—given that certain events, such as maternal or neonatal distress and unplanned surgeries, are often unpredictable and potentially traumatic—mitigating factors like a sense of control, perceived support, and active involvement in decision-making are significantly associated to CB-PTSD symptoms. Our findings thus underscore the importance of respectful maternity care and its role in mitigating CB-PTSD symptoms.

This study provided important insights into how satisfaction with quality of care can play a role in postpartum psychological well-being. For clinical practice, this should encourage midwives and others who are involved providing care for women in labor and birth to address women's expectations and encourage their participation in decision making during birth to promote satisfaction with care. Such care is in line with midwifery models of care in childbirth, presented by the International Confederation of midwives [38] and Lancet series framework for quality maternal and newborn care where a respectful and a more woman-centered care model as well as continuity is highlighted [39].

Strength and limitations

Our study was population based as questionnaires were sent to all women who had given birth in the country during the study period. Furthermore, the response rate was good with 63.4 % of the women who received the questionnaire participating, and 41.2 % answered all the questions regarding to symptoms of CB-PTSD and birth satisfaction. The study sample represented the population well in terms of age, residence, relationship status, education level, birth setting and mode of birth. Our study also had some limitations. First, our study utilized a self-report questionnaire to measure the prevalence of symptoms of CB-PTSD which could be different from clinical diagnostic interviews [40,41], but it would not have been feasible to interview such a large sample as was included in this study. Second, the psychometric properties of the Icelandic version of CityBiTS have not yet been evaluated and there is no validated clinically proven cut-off score in the Icelandic context. Therefore, we used a previously published cut-off score of >28 points [15].

Conclusions

Satisfaction with care during labor and birth was strongly associated with CB-PTSD. Parity, mode of birth and relationship status were also factors associated with CB-PTSD but no other sociodemographic or birth related factors were associated with CB-PTSD. To enhance womeńs birth experiences and reduce the risk of CB-PTSD it is crucial that midwives and other healthcare providers offer consistent support and actively involve women in decision-making during labor and birth to enhance their sense of control. By prioritizing these factors, healthcare providers can significantly improve the overall experience for women and reduce the development of trauma-related symptomspostpartum.

CRediT authorship contribution statement

Emma M. Swift: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Fjóla Guðmundsdóttir:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis. **Kristjana Einarsdóttir:** Writing – review & editing, Supervision, Methodology, Formal analysis. **Valgerður Lísa Sigurðardóttir:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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