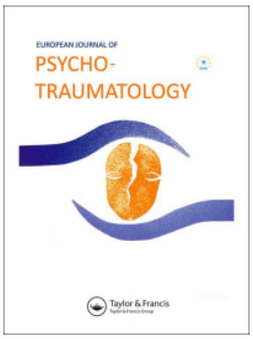

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BASIC RESEARCH ARTICLE

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Displacement and associated factors of childbirth-related posttraumatic stress disorder among Ukrainian perinatal women

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ABSTRACT

Background: The ongoing war in Ukraine has profoundly disrupted maternal healthcare and exposed women to acute psychosocial stressors throughout the perinatal period. This context may heighten the risk of childbirth-related posttraumatic stress disorder (CB-PTSD), particularly among displaced women.

Objective: To identify and compare the proportion of women meeting full diagnostic criteria for CB-PTSD and the severity of specific symptom clusters (stressor, re-experiencing, avoidance, negative cognitions and mood, hyperarousal, distress, and dissociation) by displacement status, and to examine sociodemographic, obstetric, and war-related psychosocial factors associated with CB-PTSD.

Method: Data came from an online survey of 318 Ukrainian perinatal women grouped as not displaced (ND), internally displaced (ID), or externally displaced (ED). Measures included CB-PTSD (City BiTS), assessment, care, and trust in pregnant and new mothers (ACT-PNM), and emotional stability (TIPI). Group differences in CB-PTSD diagnostic status and symptom clusters were analysed using Pearson's chi-square tests, Welch one-way ANOVAs, Spearman correlations and Kruskal–Wallis tests. Hierarchical linear regression models assessed the contribution of sociodemographic, obstetric, and war-related psychosocial factors to CB-PTSD symptom severity.

Results: Overall, 4.9% of women met full diagnostic criteria for CB-PTSD, with a tendency to higher rates across displacement groups (9.4% ID vs. 8.3% ED). Symptom differences by displacement status were only significant for the dissociation cluster, which were elevated among displaced women, while other clusters did not differ across groups. Factors significantly associated with higher CB-PTSD scores included neonatal intensive care unit admission, lack of resources, worsened perinatal care, high financial stress due to the war, greater war-related disruption in daily life, and lower emotional stability, jointly explaining 37.1% of the variance in CB-PTSD.

Conclusions: Ukrainian women giving birth during wartime face pronounced psychosocial vulnerability, particularly when displaced. These findings highlight the urgent need for trauma-informed perinatal care and targeted psychosocial support tailored to conflict-affected perinatal populations.

Trial registration: ClinicalTrials.gov identifier: NCT05654987.

Desplazamiento y factores asociados al trastorno de estrés postraumático relacionado con el parto entre las mujeres perinatales ucranianas

Antecedentes: La guerra en curso en Ucrania ha alterado profundamente la atención médica materna y ha expuesto a las mujeres a factores de estrés psicosocial agudos a lo largo del período perinatal. Este contexto puede aumentar el riesgo de trastorno de estrés postraumático relacionado con el parto (TEPT-P), especialmente entre las mujeres desplazadas.

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Childbirth-related trauma; PTSD; perinatal period; war; pregnancy; childbirth; postpartum

PALABRAS CLAVE
Trauma relacionado con el parto; TEPT; período perinatal; guerra; embarazo; parto; posparto

HIGHLIGHTS

- A substantial share of Ukrainian perinatal women experience posttraumatic stress symptoms specifically linked to childbirth.
- Internally and externally displaced women appear at heightened risk of childbirth-related posttraumatic stress, with some symptom clusters, such as dissociation, particularly elevated among displaced groups.
- Neonatal intensive care admission, deteriorated or poor perinatal care, lack of support and resources, intense financial strain, and lower emotional stability are strongly associated with more severe childbirth-related posttraumatic stress symptoms.

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Objetivo: Identificar y comparar la proporción de mujeres que cumplen todos los criterios diagnósticos del TEPT-P y la gravedad de grupos específicos de síntomas (factores estresantes, reexperimentación, evitación, cogniciones negativas y del estado de ánimo, hiperactivación, angustia y disociación) según su situación de desplazamiento, así como examinar los factores sociodemográficos, obstétricos y psicosociales relacionados con la guerra asociados al TEPT-P.
Método: Los datos procedían de una encuesta en línea realizada a 318 mujeres ucranianas en el periodo perinatal, agrupadas en tres categorías: sin desplazamiento (ND), desplazadas internamente (ID) y desplazadas externamente (ED). Las medidas incluían el trastorno de estrés postraumático relacionado con la ciudad TEPT-P, (City BiTS), la evaluación, la atención y la confianza en las mujeres embarazadas y las madres primerizas (ACT-PNM por sus siglas en ingles), y la estabilidad emocional (TIPI). Las diferencias entre los grupos en cuanto al estado diagnóstico del TEPT-P y los grupos de síntomas se analizaron mediante pruebas de chi-cuadrado de Pearson, ANOVA unidireccionales de Welch, correlaciones de Spearman y pruebas de Kruskal-Wallis. Los modelos de regresión lineal jerárquica evaluaron la contribución de los factores sociodemográficos, obstétricos y psicosociales relacionados con la guerra a la gravedad de los síntomas del TEPT-P.
Resultados: En general, el 4,9% de las mujeres cumplía todos los criterios diagnósticos del TEPT-P, con una tendencia a tasas más elevadas en los grupos de desplazadas (9,4% en el grupo de desplazadas internas frente al 8,3% en el grupo de desplazadas externas). Las diferencias en los síntomas según la situación de desplazamiento solo fueron significativas en el grupo de síntomas de disociación, que se mostraron elevados entre las mujeres desplazadas, mientras que los demás grupos de síntomas no presentaron diferencias entre los grupos. Los factores significativamente asociados con puntuaciones más altas de TEPT-P incluyeron el ingreso en la unidad de cuidados intensivos neonatales, la falta de recursos, el empeoramiento de la atención perinatal, el alto estrés financiero debido a la guerra, una mayor alteración de la vida cotidiana relacionada con la guerra y una menor estabilidad emocional, lo que en conjunto explica el 37,1% de la varianza en el TEPT-P.
Conclusiones: Las mujeres ucranianas que dan a luz en tiempos de guerra se enfrentan a una marcada vulnerabilidad psicosocial, especialmente cuando se ven desplazadas. Estos hallazgos ponen de relieve la urgente necesidad de una atención perinatal que tenga en cuenta el trauma y de un apoyo psicosocial específico adaptado a las poblaciones perinatales afectadas por el conflicto.

1. Introduction

Experiences of childbirth are inherently complex and shaped by perceived control, communication with professionals, support, and individual expectations (Hollander et al., 2017; Wigert et al., 2020). Expectations influence how women experience labour, which birth options they choose, and their sense of control (Hauck et al., 2007; Hosseini Tabaghdehi et al., 2020). Negative birth experiences have been associated with fear of birth, history of abuse, poor self-rated health, psychiatric problems, and low social support (Henriksen et al., 2017; Viirman et al., 2022), and in war contexts psychological and environmental stressors further increase the likelihood of childbirth-related traumatic experiences (Nikitina et al., 2023; Rodríguez-Muñoz et al., 2025).

Childbirth-related posttraumatic stress disorder (CB-PTSD) is a severe mental health condition in which posttraumatic stress symptoms arise specifically following a traumatic or highly distressing birth (Ayers et al., 2006, 2016). It encompasses the core PTSD clusters – re-experiencing, avoidance, negative cognitions and mood, and hyperarousal – associated with childbirth (American Psychiatric Association, 2022), including both birth-focused symptoms (e.g. intrusive memories and avoidance of reminders of childbirth) and more general symptoms, such as heightened alertness and persistent negative emotional states (Ayers et al., 2018).

Risk factors for CB-PTSD include obstetric variables such as mode of delivery, complications affecting mother or infant, and unplanned or invasive procedures (Khsim et al., 2022; Riquelme-Gallego et al., 2025). Prenatal stress constitutes an additional adverse condition. Psychosocial risks comprise a history of psychiatric disorders (particularly anxiety and depression), a negative appraisal of childbirth marked by intense fear or perceived loss of control, and poor coping mechanisms (Andersen et al., 2012; Simpson et al., 2018), as well as low emotional stability (Frankham et al., 2024; Grand et al., 2024; Price et al., 2020). Social risk factors include low perceived support, dissatisfaction with care, and broader social vulnerability (e.g. lower socioeconomic status, lack of partner involvement; Chen et al., 2024; Grekin & O'Hara, 2014), whereas perceived social support, respectful and woman-centred care, immediate skin-to-skin contact, and adherence to birth preferences act as protective factors (Hernández-Martínez et al., 2020; Vega-Sanz et al., 2025). These dimensions jointly shape the overall risk of CB-PTSD (Chabbert et al., 2021; Kranenburg et al., 2023).

Data from different countries estimate CB-PTSD prevalence at around 3.1–4.7% (Grekin & O'Hara, 2014; Heyne et al., 2022; Kranenburg et al., 2023; Vereault et al., 2012), rising to approximately 19% among women with pregnancy complications and preterm birth (Yildiz et al., 2017) and up to 39% after perinatal

loss (Christiansen, 2017). However, most research involves women in civilian settings rather than those exposed to war or armed conflict, where traumatic events, perceived threat to one's own and the baby's life, environmental instability, and constrained access to health services can profoundly alter childbirth experiences and decisions (Krupelnytska & Morozova-Larina, 2025; Nikitina et al., 2023). Since the full-scale Russian invasion in 2022, Ukrainian pregnant and postpartum women have been exposed to bombardments, financial hardship, damaged infrastructure, and reduced social support (Karatzias et al., 2023; Krupelnytska, Vavilova, et al., 2025). Ukrainian refugee women have also shown low financial resilience despite prior familiarity with financial services (Baumann & Kelly, 2022), and social support resources and participation in support groups appear less prevalent in host countries, reflecting resettlement challenges (Bogdanova, 2022). Medical data indicate a reduction in birth weight – from a median of 3,500 grams before the full-scale war to 3,350 grams afterwards (Arbuzova et al., 2025) – and qualitative interviews describe difficulties accessing care and disappointment among women who could not give birth in their planned hospitals (Krupelnytska & Morozova-Larina, 2025).

In this context, many health facilities, especially close to the front lines, have been damaged or destroyed, while others consolidated services as smaller hospitals closed (Artyomenko et al., 2025; Krupelnytska, Morozova-Larina, et al., 2025). As a result, women may have limited choice or have to travel further to larger regional centres with working maternity wards. Besides, many women have been internally or externally displaced, a situation that changes the support network and may carry financial hardship, potentially affecting women's mental health (Chrzan-Dętkoś et al., 2022; Gusak et al., 2024; Kostiuk et al., 2024). The war context multiplies the risk factors for traumatic childbirth by increasing the sensation of loss of control, exposure to life-threatening events, and constrained medical care. Even though there are no official and systematic data on the number of displacements and births in Ukrainian women in the ongoing war, studies have shown that in conflict settings, women often give birth with limited choice, under direct threat of violence or separated from their families (Rodríguez-Muñoz et al., 2023; Sennersten et al., 2025).

Although CB-PTSD is increasingly recognised as a major perinatal mental health concern, evidence from conflict-affected populations remains scarce (Bogdanova, 2022; Chrzan-Dętkoś et al., 2022; Rodríguez-Muñoz et al., 2025). Traditional models of complex trauma often overlook distinctive stressors linked to armed conflict, such as widespread displacement, ongoing threats, and humanitarian crises (Chrzan-Dętkoś et al., 2022; Rodríguez-Muñoz et al., 2025). Research comparing displacement status suggests meaningful differences in mental health between internally displaced (ID) and externally displaced (ED) persons (Lushchak et al., 2023). Meta-analyses and comparative studies indicate that mental disorder risk is shaped by the displacement context, with ED frequently showing elevated rates due to adjustment demands, legal uncertainty, and social isolation (Dahie et al., 2024; Lane et al., 2025; Patanè et al., 2022), whereas some studies report equal or greater risk among ID in settings with intense local adversity (Birhan et al., 2023; Blackmore et al., 2020; Schmidt et al., 2008).

Building on this, the present study aims to (1) identify and compare the proportion of women with full diagnostic criteria for CB-PTSD and the severity of symptom clusters (stressor, re-experiencing, avoidance, negative cognitions and mood, hyperarousal, distress and impairment and dissociation) according to their displacement status, and (2) examine sociodemographic factors, obstetric and contextual birth-related variables, and psychosocial war-related stressors associated with CB-PTSD.

2. Methods

2.1. Study design

This cross-sectional survey is part of the Perinatal Mental Health for Refugee Women (PMH-RW) Project, following a preregistered protocol described by Rodríguez-Muñoz et al. (2023) and preregistered via Clinicaltrials.gov under registration number NCT05654987 of 16 December 2022.

2.2. Participants

Power calculations and rationale for sample size are referenced in the project protocol (Rodríguez-Muñoz et al., 2023). Eligibility criteria were women aged 18 or older who were biological mothers of infants aged ≤12 months, residing in Ukraine during or after the Russian invasion or as refugees in the EU, and who provided informed consent. A total of 371 Ukrainian women accessed the questionnaires, of which 369 were eligible. According to our research aims, only women who completed the City BiTS questionnaire were included in the analyses ($n = 318$).

2.3. Procedure

Data collection was conducted online via the Qualtrics XM platform between December 2022 and October 2023, using recruitment channels such as social media, media outlets, refugee support centres, and direct outreach through networks in Ukraine and Poland, in coordination with the COST Action Research Innovation and Sustainable Pan-European Network in

Peripartum Depression Disorder (Riseup-PPD CA18138). Ethical approval was granted by the ethics committees of UNED and Taras Shevchenko National University of Kyiv, and all participants provided informed consent. In line with the research plan and ethical considerations regarding participant safety, the exact age of women and their babies was not collected.

2.4. Measurement

2.4.1. Childbirth-related posttraumatic stress disorder

City Birth Trauma Scale (City BiTS, Ayers et al., 2018) in the Ukrainian adaptation of the instrument (Chrzan-Dętkoś, Murawska, et al., 2026). It consists of 29 self-report items, which assess posttraumatic stress symptoms following childbirth in line with DSM-5 criteria: two dichotomous items (yes/no) that address the A stressor criterion (the threat of death or serious injury to the mother or the baby during labour, birth, or immediately afterward, $\alpha = .77$). The frequency of re-experiencing (criterion B, five items, $\alpha = .84$), avoidance (criterion C, two items, $\alpha = .77$), negative cognitions and mood (criterion D, seven items, $\alpha = .78$), and hyperarousal symptoms (criterion E, six items, $\alpha = .88$) and dissociation (two items, $\alpha = .78$) experienced in the week preceding the assessment. Response options are rated on a four-point Likert scale (0 = not at all – 3 = five or more times). The sum of these scores results in a total score ranging from 0 to 60, where higher scores indicate elevated levels of CB-PTSD symptoms. Two items assess symptom onset and duration (criterion F, $\alpha = .81$), three items assess distress (criterion G, $\alpha = .76$) and one item possible exclusion causes of PTSD (criterion H), with yes/no/sometimes response options. To meet full diagnostic criteria of CB-PTSD, women had to report at least one re-experiencing symptom, one avoidance symptom, two symptoms of negative cognitions and mood, and two hyperarousal symptoms, in addition to meeting criteria for symptom duration, distress/impairment, and exclusion of other causes. Two main subscales are identified: Birth-related symptoms (BRS, $\alpha = .91$), primarily composed of items measuring re-experiencing, avoidance, and negative cognitions and mood related to birth, and General symptoms (GS, $\alpha = .88$), mainly consisting of items assessing negative cognitions and mood and hyperarousal. The scores for each symptom cluster and diagnosis were calculated following Tomsis (2025) protocol. Therefore, total CB-PTSD scores and the main subscales (BRS and GS) are analysed as continuous scores reflecting the overall severity of CB-PTSD symptoms. In contrast, specific symptom criteria focus on the presence/absence of specific symptom clusters (e.g. A-H, dissociation) and full CB-PTSD diagnosis (yes/no), treated as categorical variables.

2.4.2. Displacement status, assessment, care, and trust – in pregnant and new mothers

The ACT-PNM questionnaire (Rodríguez-Muñoz et al., 2023) was used to assess sociodemographic and contextual aspects of pregnant women's experiences under war-time conditions and war-related relocation. For this study, specific questions included in the analysis were: (a) Sociodemographic factors: Displacement status (no displacement, internally displaced, externally displaced), education (incomplete secondary, full secondary, higher education graduate, no degree, bachelor's degree, master's degree, scientific degree); Marital status (single, partnered/married, divorced/separated, widowed, other); Participation in support groups (yes/no); and a question examining the types of support respondents perceived as lacking since the onset of the war (housing, access to medical care and health information, adaptation processes within the host country, language courses, material assistance, and emotional or social support). For analytical purposes, a dichotomous variable was created, coded as 'yes' when respondents indicated the absence of at least one type of support and 'no' when support was not lacking in any of the previous mention dimensions. This variable was labelled 'Lack of resources' (At least one lackingNot lacking); (b) Obstetric and contextual birth-related factors: Birth setting (chosen hospital, available hospital, home birth, non-medical location); Child admission to Neonatal Intensive Care Unit (NICU) after birth (yes/no); Type of pregnancy (singleton/twin); Quality of healthcare received (1 very poor – 4 good); and (c) War-related stressors: Changes in perinatal care due to war (1 significantly worsened – 5 much improved); War-related disruption in daily life; Financial stress due to war (1 very weak – 5 very strong); primary source of stress (healthcare/food, safety concerns, financial problems, impact on family/friends, impact on country/community, access to baby products, not feeling stressed). Given the focus on the deteriorating impact of the war on perinatal care, the original response scales for healthcare quality and war-related changes in perinatal care were reverse-coded so that higher scores reflected greater worsening of the quality of medical support and perinatal care.

2.4.3. Emotional stability

Emotional stability was measured with two items from the emotional stability subscale of the Ten Item Personality Inventory (TIPI; Gosling et al., 2003). Scores were computed by reverse-scoring the 'anxious, easily upset' item and averaging it with the 'calm, emotionally stable' item, in line with the TIPI scoring protocol. Responses were given on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In line with recommendations on the limitations of two-item scales, internal consistency was assessed with

correlation coefficients (Eisinga et al., 2013; Thørrisen et al., 2023) showing an acceptable correlation ($r = .44$, $p < .001$). Participants were instructed to rate how well each description applied to them in general, rather than over a specific time period. A higher score reflected a higher emotional stability.

2.5. Statistical methods

Pearson's chi-square tests and one-way ANOVAs with Welch's correction and Games–Howell post hoc comparisons were used to assess group differences (ND, ID, ED) in categorical and continuous sample characteristics, as well as in the proportions meeting full CB-PTSD criteria and the severity of specific symptom dimensions (re-experiencing, avoidance, negative cognitions, and hyperarousal). Kruskal–Wallis tests (one-way ANOVAs on ranks) were applied to compare mean CB-PTSD levels based on City BiTS total and subscale (BRS, GS) scores, with Dwass–Steel–Critchlow–Fligner post hoc tests, given the non-normal distribution of City BiTS scores. Spearman's correlations examined associations between displacement status, City BiTS diagnostic criteria and full CB-PTSD diagnosis. Specifically, to address the first aim, we examined both continuous City BiTS scores (total, BRS, and GS) and the presence of each criterion (A–H) and full CB-PTSD diagnosis (yes/no), following the City BiTS scoring protocol. Hierarchical linear regression models using the continuous City BiTS total score addressed the second aim. Multicollinearity was examined with variance inflation factor (VIF) and tolerance; VIFs ranged from 1.02 to 1.05 and tolerance values ranged from 0.93 to 0.98, indicating no problematic collinearity. Variables were entered in three blocks according to theoretical relevance and temporal proximity to childbirth: (1) sociodemographic factors, (2) obstetric and contextual birth-related factors, and (3) psychosocial war-related stressors. All analyses were conducted with Jamovi v.2.6 (The Jamovi project, 2024).

3. Results

The main characteristics of the sample are presented in Table 1. Most participants were partnered or married and held higher education degrees. The majority were first-time mothers who experienced singleton pregnancies and gave birth in hospital settings. Significant group differences were observed in birth setting and primary source of stress. ED women were less likely to give birth in a hospital of their choice and more likely to deliver in whichever facility was available at the time compared to ND and ID women. As expected, ED participants reported the impact of the war on family and friends as their primary source of stress more often than ND women, who more frequently endorsed safety concerns; ID women generally showed intermediate patterns. No other differences were found across groups in categorical characteristics.

Regarding continuous variables, displacement status was associated with differences in war-related disruption in daily life but not with financial stress, perceived quality of healthcare, or changes in perinatal care. Both ID and ED women experienced greater disruption in daily life than ND participants, whereas no significant differences emerged between groups in financial stress due to the war. No other significant group differences were observed in continuous variables.

3.1. Overall CB-PTSD severity (City BiTS total score and subscales)

Table 2 presents the distribution of the continuous City BiTS total score and its two main subscales: Birth-related Symptoms (BRS) and General Symptoms (GS) by displacement status. These indices reflect overall CB-PTSD symptom severity in each group. Kruskal–Wallis tests indicated a statistically significant, yet small, difference in CB-PTSD total score between groups, $\chi^2(2) = 6.02$, $p = .049$, $\varepsilon^2 = .019$; whereas there were no significant group differences in BRS or GS ranks ($ps \geq .146$)

Post hoc non-parametric comparisons suggested a marginal tendency for ID women to report higher CB-PTSD total scores than ND women ($W = 3.24$, $p = .057$), while all other pairwise comparisons were not significant ($ps \geq .445$). No meaningful between-group differences emerged for BRS or GS.

3.2. Specific CB-PTSD diagnostic criteria and symptom clusters

Table 3 summarises Spearman correlations among displacement status, City BiTS diagnostic criteria (A–H), dissociation, and CB-PTSD diagnosis. Overall, the pattern of associations between displacement status and City BiTS criteria suggested only small, mostly non-significant relationships. Displacement status showed weak positive associations with negative cognitions and mood, duration, dissociation, and, to a lesser extent, CB-PTSD diagnosis, indicating that symptom burden tended to be slightly higher in displaced women, but the magnitude of these associations remained modest. In contrast, correlations among the City BiTS criteria themselves were consistently stronger: re-experiencing, avoidance, negative cognitions and mood, and hyperarousal were all positively interrelated and also associated with dissociation and distress/impairment, supporting the idea of a shared underlying CB-PTSD symptom dimension. CB-PTSD diagnosis was more closely tied to several core criteria – particularly the stressor

Table 1. Sociodemographic, obstetric and contextual birth-related characteristics, and psychosocial war-related stressors overall and by displacement status.

Variable	Category	Total *n*	ND *n* (%)	ID *n* (%)	ED *n* (%)
		318	226 (71.1)	32 (10.1)	60 (18.9)
Level of education	Incomplete secondary education	4	3 (1.3)	1 (3.1)	0 (0.0)
	Full secondary education	32	24 (10.6)	5 (15.6)	3 (5.0)
	Incomplete higher education	14	8 (3.5)	2 (6.3)	4 (6.7)
	Bachelor's degree	71	49 (21.7)	7 (21.9)	15 (25.0)
	Master's degree	188	134 (59.3)	17 (53.1)	37 (61.7)
	Scientific degree	9	8 (3.5)	0 (0.0)	1 (1.7)
Marital status	Single	6	3 (1.3)	1 (3.1)	2 (3.3)
	Partnered/Married	277	201 (88.9)	29 (90.6)	47 (78.3)
	Divorced/Separated	30	18 (8.0)	2 (6.3)	10 (16.7)
	Widowed	4	3 (1.3)	0 (0.0)	1 (1.7)
	Other	1	1 (0.4)	0 (0.0)	0 (0.0)
First child	Yes	190	142 (63.4)	20 (62.5)	28 (46.7)
	No	126	82 (36.6)	12 (37.5)	32 (53.3)
	Missing data	2			
Type of pregnancy	Singleton pregnancy	312	223 (99.1)	31 (96.9)	58 (96.7)
	Twin pregnancy	5	2 (0.9)	1 (3.1)	2 (3.3)
	Missing data	1			
Birth setting	Hospital chosen in advance	247	195 (86.7)[a]	22 (68.8)[ab]	30 (50.0)[b]
	Hospital available at the time	66	29 (12.9)[a]	10 (31.3)[ab]	27 (45.0)[b]
	Home birth	2	0 (0.0)	0 (0.0)	2 (3.3)
	Non-medical location (subway, basement, open air, etc.)	2	1 (0.4)	0 (0.0)	1 (1.7)
	Missing data	1			
Child treated in the NICU	Yes	23	14 (6.2)	5 (15.6)	4 (6.7)
	No	294	211 (93.8)	27 (84.4)	56 (93.3)
	Missing data	1			
Lack of resources	No lack of resources	183	138 (61.1)	17 (53.1)	28 (46.7)
	At least one resource lacking	135	88 (38.9)	15 (46.9)	32 (53.3)
Participation in support groups	Yes	117	85 (37.6)	14 (45.2)	18 (30.0)
	No	200	141 (62.4)	17 (54.8)	42 (70.0)
	Missing data	1			
Primary source of stress	Healthcare and access to food	4	4 (1.8)	0 (0.0)	0 (0.0)
	Safety concerns	127	108 (47.8)[a]	11 (34.4)[ab]	8 (13.3)[b]
	Financial problems	33	18 (8.0)	5 (15.6)	10 (16.7)
	Impact on family/friends	64	31 (13.7)[a]	10 (31.3)[ab]	23 (38.3)[b]
	Impact on the country/community	79	58 (25.7)	4 (12.5)	17 (28.3)
	Access to baby products	3	2 (0.9)	1 (3.1)	0 (0.0)
	I do not feel stressed	8	5 (2.2)	1 (3.1)	2 (3.3)
Variable	**Total *n* (missing)**	**Total *M* (SD)**	**ND *M* (SD)**	**ID *M* (SD)**	**ED *M* (SD)**
Financial stress due to war	317 (1)	4.39 (1.42)	4.20 (1.36)	4.90 (1.54)	4.62 (1.35)
Quality of healthcare received	317 (1)	1.45 (0.65)	1.42 (0.62)	1.63 (0.87)	1.47 (0.57)
Changes in perinatal care due to war	317 (1)	3.09 (0.71)	3.12 (0.67)	2.94 (0.72)	3.08 (0.85)
War-related disruption in daily life	318 (0)	5.21 (1.35)	4.89 (1.29)[a]	5.81 (1.28)[b]	5.82 (1.27)[b]

Notes: ND = non-displaced; ID = internally displaced; ED = externally displaced (host country). Values are *n* (%) for categorical variables and *M* (SD) for continuous variables. Percentages within ND, ID, and ED columns are calculated within each group. Means or proportions with different superscript letters differ significantly at $p < .05$ based on post hoc comparisons (chi-square tests with adjusted residuals for categorical variables; Welch one-way ANOVA with Games–Howell post hoc tests for continuous variables).

and avoidance criteria – than to displacement status *per se*, while the exclusion criterion again showed minimal overlap with both displacement and other symptom domains.

Table 4 presents the categorical distribution of City BiTS diagnostic criteria (A–H, dissociation) and full CB-PTSD diagnosis by displacement status. This analysis examined the likelihood of meeting each criterion and of fulfilling the full diagnostic criteria for CB-PTSD in each group. Detailed prevalence of DSM 5 criteria A–H in the full sample has been reported previously in the Ukrainian validation

Table 2. Descriptive Statistics of City BiTS total score and subscales by displacement status.

Subscale	Displacement Status	Mean	Median	SD	Min	Max
Total CB-PTSD	ND	11.24	10.00	10.63	0.00	51.00
	ID	15.81	13.50	11.43	0.00	38.00
	ED	13.55	9.50	12.41	0.00	52.00
BRS	ND	3.40	1.00	4.92	0.00	27.00
	ID	5.91	3.50	6.66	0.00	22.00
	ED	3.75	1.00	5.28	0.00	25.00
GS	ND	7.84	6.00	7.61	0.00	29.00
	ID	9.90	8.00	7.82	0.00	29.00
	ED	9.80	7.00	8.85	0.00	30.00

Notes: ND = Not displaced ($n = 226$); ID = Internally displaced ($n = 32$); ED = Externally displaced ($n = 60$); CB-PTSD = level of CB-PTSD according to City BiTS; BRS = Birth-related symptoms Subscale; GS = General Symptoms Subscale.

Table 3. Spearman correlations among displacement status, City BiTS diagnostic criteria, dissociation, and CB-PTSD diagnosis.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Displacement status	–										
2. A: Stressor	−.00	–									
3. B: Re-experiencing	.01	.29***	–								
4. C: Avoidance	.13*	.21***	.47***	–							
5. D: Negative cognitions and mood	.06	.23***	.38***	.28***	–						
6. E: Hyperarousal	.11*	.18**	.21***	.12*	.55***	–					
7. F: Duration	.02	−.06	−.07	−.12*	−.06	−.12*	–				
8. G: Distress/impairment	.09	.21***	.31***	.19***	.46***	.52***	.07	–			
9. H: Exclusion	−.04	.04	.01	.01	−.06	−.10	.04	−.09	–		
10. Dissociation	.11*	.19***	.27***	.15**	.49***	.41***	−.02	.36***	−.02	–	
11. CB-PTSD diagnosis (yes/no)	.10	.30***	.23***	.43***	.22***	.15**	.10	.26***	−.08	.15**	–

Notes: All coefficients are Spearman's ρ. Cells above the diagonal are left blank for clarity. *$p < .05$, **$p < .01$, ***$p < .001$. Displacement status was coded as follows: ND = 0; ID = 1; ED = 2.

paper of this scale (Chrzan-Dętkoś, Murawska, et al., 2026), therefore, here we focus on group comparison only.

As for stressor criterion (A), this proportion did not differ significantly by displacement status, suggesting that perceptions of life threat were relatively common in this wartime context regardless of relocation. Re-experiencing symptoms (B), avoidance (C), negative cognitions and mood (D), and hyperarousal (E) also showed no significant group differences, indicating that these core CB-PTSD symptom clusters were broadly pervasive across all displacement groups. Even though group differences did not reach conventional levels of statistical significance, avoidance symptoms appeared more frequently among displaced women – particularly those residing in host countries – compared with ND women.

Although nearly 85% of women met the City BiTS duration criterion (F), this does not imply that most developed full CB-PTSD; criterion F only captures whether symptoms persisted for at least one month, which is expected in a war and postpartum context even when overall symptom severity remains moderate, and only a small subgroup fulfills the full diagnosis. Almost half of the sample fulfilled the distress and impairment criterion (G), and only about one in ten women met the exclusion criterion (H), again without significant differences by displacement status.

Dissociation showed a statistically significant difference across groups, $\chi^2(2) = 8.46$, $p = .015$, $\varepsilon^2 = .03$. Pairwise non-parametric comparisons indicated that ED women were significantly more likely to endorse dissociation than ND women ($p = .021$). The difference between ID and ED women approached significance ($p = .055$), suggesting a trend towards higher dissociation among ED. The comparison between ND and ID was not significant. Finally, group differences in CB-PTSD diagnosis (meeting all criteria – yes/no) did not reach statistical significance, likely reflecting the small number of diagnosed cases and limited power to detect modest between-group effects.

Table 4. City BiTS diagnostic criteria and full CB-PTSD diagnosis by displacement status.

Criterion	ND *n* (%)	ID *n* (%)	ED *n* (%)	χ^2	*p*
A: Stressor	83 (36.7)	16 (50.0)	19 (31.7)	3.05	.218
B: Re-experiencing symptoms	111 (49.1)	21 (65.6)	27 (45.0)	3.78	.151
C: Avoidance symptoms	42 (18.6)	10 (31.3)	18 (30.0)	5.35	.069
D: Negative cognitions and mood	116 (51.3)	20 (62.5)	34 (56.7)	1.71	.426
E: Hyperarousal	150 (66.4)	26 (81.3)	46 (76.7)	4.58	.101
F: Duration	191 (84.5)	27 (84.4)	52 (86.7)	0.18	.914
G: Distress and impairment	92 (40.7)	15 (46.9)	31 (51.7)	2.49	.289
H: Exclusion criteria	27 (11.9)	1 (3.1)	7 (11.7)	1.71	.425
Dissociation	78 (34.5)	9 (28.1)	32 (53.3)	8.46	.015
CB-PTSD diagnosis (meeting all criteria)	8 (3.5)	3 (9.4)	5 (8.3)	3.67	.159

Note: All variables were coded 0/1 (0 = criterion not met, 1 = criterion met) except for CB-PTSD diagnosis, which was coded 0 = no diagnosis, 1 = diagnosis.

3.3. Factors associated with CB-PTSD scores

Hierarchical linear regression models were performed to identify factors associated with CB-PTSD scores. In **Model 1**, sociodemographic variables were included. The model was significant, $F(14, 295) = 2.29$, $p = .006$, explaining 9.7% of the variance in CB-PTSD. Within this model, lack of resources was significantly associated with higher scores ($B = 4.09$, $SE = 1.29$, t = 3.16, $p = .002$, CI [1.55, 6.64]), indicating that women reporting at least one lacking resource scored higher on CB-PTSD than those who reported no lack of resources. There was also a trend-level association for displacement status, ID women tended to report higher CB-PTSD scores than ND women ($B = 4.87$, $SE = 2.14$, $t = 2.27$, $p = .024$), whereas ED did not differ significantly from ND women ($B = 1.85$, $SE = 1.67$, $t = 1.11$, $p = .26$). In **Model 2**, obstetric and contextual birth-related variables were added, significantly improving the model ($\Delta R^2 = .101$, $F_\Delta(6, 289) = 6.05$, $p < .001$), yielding $R^2 = .198$ and an overall $F(20, 289) = 3.56$, $p < .001$. In this step, lack of resources remained a significant predictor ($B = 4.40$, $SE = 1.24$, $t = 3.56$, $p < .001$, CI [1.97,6.84]), together with having a child treated in an NICU ($B = -6.76$, $SE = 2.44$, $t = -2.78$, $p = .006$, CI [−11.56, −1.97]) and lower perceived quality of healthcare received

Table 5. Coefficients for regression Model 3 for CB-PTSD symptoms ($n = 310$).

Factors	Variable/Category	*B*	SE	*β*	*t*	*p*	95% CI for *B*
	(Intercept)	−4.85	9.41	–	−0.52	.607	[−23.38, 13.68]
Sociodemographic variables	**Displacement status** (ref: ND)						
	ID	0.14	1.96	0.01	0.07	.942	[−3.72, 4.00]
	ED	−1.52	1.66	−0.14	−0.91	.363	[−4.79, 1.76]
	Marital status (ref: single)						
	Partnered/Married	−0.54	4.68	−0.05	−0.11	.909	[−9.76, 8.68]
	Divorced/Separated	0.83	4.88	0.07	0.17	.865	[−8.78, 10.45]
	Widowed	10.88	6.69	0.97	1.63	.105	[−2.29, 24.05]
	Other	20.57	12.54	1.83	1.64	.102	[−4.11, 45.25]
	Level of education (ref: incomplete secondary)						
	Full secondary	6.50	5.43	0.58	1.20	.233	[−4.20, 17.19]
	Incomplete higher	6.28	5.88	0.56	1.07	.286	[−5.29, 17.84]
	Bachelor's	5.07	5.26	0.45	0.96	.336	[−5.29, 15.43]
	Master's	7.16	5.26	0.64	1.36	.175	[−3.21, 17.52]
	Scientific degree	1.01	6.31	0.09	0.16	.873	[−11.41, 13.44]
	First child (ref: yes)						
	No	−2.22	1.17	−0.20	−1.90	.058	[−4.51, 0.08]
	Participation in support group (ref: Yes)						
	No	−0.24	1.16	−0.02	−0.21	.837	[−2.51, 2.04]
	Lack of resources (ref: no lack)						
	At least one is lacking	2.79	1.16	0.25	2.41	.017	[0.51, 5.07]
Obstetric and contextual birth-related variables	**Birth setting** (ref: Chosen in advance)						
	Available hospital	1.82	1.52	0.16	1.19	.235	[−1.19, 4.82]
	Home birth	−4.45	9.67	−0.40	−0.46	.646	[−23.48, 14.59]
	Non-medical place	0.90	6.90	0.08	0.13	.897	[−12.68, 14.47]
	Child treated in NICU (ref: yes)						
	No	−5.55	2.25	−0.50	−2.47	.014	[−9.99, −1.12]
	Type of pregnancy (ref: singleton)						
	Twin pregnancy	0.88	4.56	0.08	0.19	.847	[−8.09, 9.85]
	Quality of healthcare received	2.92	0.91	0.17	3.22	.001	[1.14, 4.71]
War-related stressors	**Changes in perinatal care due to war**	0.98	0.81	0.06	1.20	.231	[−0.63, 2.58]
	Financial stress from war	1.09	0.47	0.14	2.35	.019	[0.18, 2.01]
	War-related disruption in daily life	1.60	0.47	0.19	3.39	<.001	[0.67, 2.53]
	Primary stress source (ref: healthcare and access to food)						
	Safety concerns	5.04	5.64	0.45	0.89	.372	[−6.06, 16.14]
	Financial problems	4.05	5.89	0.36	0.69	.492	[−7.54, 15.65]
	Impact on family/friends	6.72	5.71	0.60	1.18	.240	[−4.53, 17.96]
	Impact on country/community	7.19	5.64	0.64	1.28	.203	[−3.91, 18.28]
	Access to baby products	8.29	8.04	0.74	1.03	.303	[−7.53, 24.12]
	Feels no stress	1.80	6.55	0.16	0.28	.783	[−11.08, 14.69]
	Emotional stability	−2.46	0.41	−0.31	−5.97	<.001	[−3.28, −1.65]

Notes: ND = Not displaced; ID = Internally displaced; ED = Externally displaced. ref = reference category; NICU = Neonatal Intensive Care Unit. Quality of healthcare and changes in perinatal care related to war were reverse-coded so that higher scores reflected greater worsening of the quality of medical support and perinatal care.

before and after childbirth ($B = 3.96$, $SE = 0.97$, $t = 4.10$, $p < .001$, CI [2.06, 5.86]).

Finally, in **Model 3**, war-related stressors were introduced. This model further increased the explained variance ($\Delta R^2 = .173$, $F_\Delta(10, 279) = 7.67$, $p < .001$), resulting in a total explained variance of $R^2 = .371$ with an overall $F(30, 279) = 5.48$, $p < .001$. A detailed summary of the final model's coefficients is presented in Table 5. Statistically significant factors associated with CB-PTSD were lack of resources, having a child treated in NICU, lower perceived quality of healthcare received, greater financial stress related to the war, higher war-related disruption in daily life and lower emotional stability (see Figure 1).

To enable comparison between displaced groups, we re-estimated the fully adjusted regression model using externally displaced (ED) women as the reference category. In this additional model, the pattern of significant predictors and the proportion of explained variance in CB-PTSD scores were essentially identical to those observed in the main analysis ($R^2 = .371$), indicating that the model is stable across coding reference for displacement status. All significant predictors retained the same direction and significance levels as in the primary model. The only notable change concerned displacement status: in this re-parameterised model, neither ND nor ID women differed significantly from ED women in CB-PTSD scores in Model 1. This indicates that, when using externally displaced women as the reference group, displacement status does not emerge as a strong independent predictor of CB-PTSD symptoms. Detailed coefficients for this model are provided in Table S1 in the Supplementary Material. Considered alongside the original model with ND as the reference group, these findings indicate that displacement status is a relatively weak independent predictor once broader variables are taken into account.

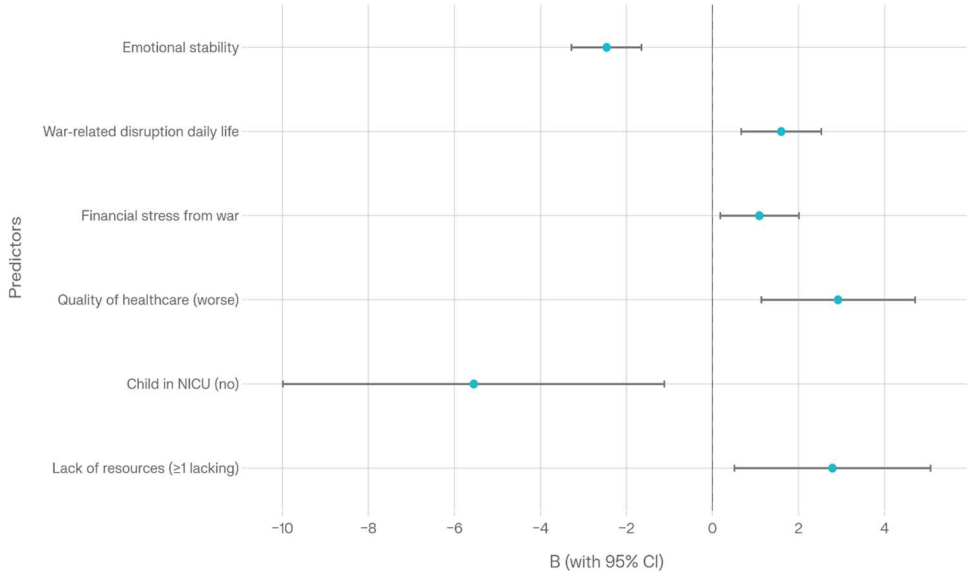

Figure 1. Hierarchical linear regression estimates for CB-PTSD scores (Model 3).

Notes: Hierarchical linear regression estimates (Model 3) for CB-PTSD symptoms. Unstandardised coefficients (B) and 95% confidence intervals are displayed for predictors retained in the final model.

4. Discussion

The present study was guided by two specific aims: (1) to identify and compare the proportion of women who meet full diagnostic criteria for CB-PTSD and the severity of symptom clusters according to displacement status (2) to examine factors associated with CB-PTSD. Addressing the first aim, the overall score for CB-PTSD only showed a marginal difference between ND and ID, while the proportion of women displaying CB-PTSD symptoms and meeting full diagnostic criteria differed descriptively across displacement groups, but these differences did not reach conventional levels of statistical significance. Findings suggest that displacement – both internal and external – is modestly associated with some CB-PTSD indicators but does not consistently translate into large between-group differences in overall symptom burden. In particular, avoidance and dissociation symptoms appeared more pronounced in displaced groups, whereas other symptom clusters were relatively similar across groups. The proportion of women meeting other CB-PTSD criteria, such as re-experiencing and negative cognitions, was similar across groups. However, avoidance and dissociation were more frequently reported in displaced women, especially among those living in host countries, even though avoidance did not reach conventional significance thresholds. Dissociation showed a statistically significant difference across groups, with ED women more likely to report dissociative symptoms than ND women, whereas ID women did not differ significantly from either group. This finding suggests that dissociation may be particularly sensitive to the combined effects of forced migration, exposure to new environments, and the stress of childbirth under uncertainty. The higher levels of dissociation observed among displaced women may also reflect the impact of repeated or chronic traumatic exposure. Comparisons with research in other conflict zones (Bosnia, Sudan, Ethiopia) emphasise that displacement status is associated with a greater vulnerability to trauma or stress even when exposure levels vary (Birhan et al., 2023; Hunt & Gakenyi, 2005; Khalil et al., 2024; Schmidt et al., 2008).

The full criteria for CB-PTSD were met in 4.9% of women, while for ID women increased to 9.4% and up to 8.3% among ED, however, these differences did not reach the conventional significance threshold. Nonetheless, given the war context, this percentage is higher compared with the highest estimations so far identified in community samples in recent meta-analyses that set a ranged from 3 to 4.7% (Dikmen-Yildiz et al., 2018) or in other studies using City BiTS Scale (Škodová et al., 2025). Importantly, the finding that displaced participants exhibited a tendency for a higher proportion of cases meeting full diagnostic criteria for CB-PTSD aligns with broader evidence from studies on war-affected Ukrainian populations that highlights the potential association of war and displacement on mental health (Lushchak et al., 2023). In general, the overall burden of trauma was greater for those experiencing displacement. These findings are consistent with previous evidence of a higher risk of mental illness and stress symptoms in displaced populations (Blackmore et al., 2020; Lushchak et al., 2023). Refugee populations who have experienced traumatic events often are vulnerable to increased symptoms if they experience another stressful event and childbirth can, in some cases, be such a factor (Schock et al., 2016). Given the lack of studies analysing CB-PTSD

in conflict situations, the comparison with PTSD in war settings may be informative. In particular, Khalil et al. (2024) found that among survivors of the Sudanese conflict, refugees were 1.4 times more likely to develop PTSD than ID and ND individuals, despite the fact that ND individuals had higher levels of exposure to war events. Similar findings have been previously reported in the Bosnian population. Refugees scored significantly higher on trauma symptoms; and their trauma symptoms were associated with harm-avoidance personality traits (Hunt & Gakenyi, 2005). However, a study of a small number of Bosnian refugee women ($n = 29$), ID women ($n = 26$) and ND women ($n = 32$) ten years after an armed conflict found higher PTSD symptoms in IDs as compared with ED and ND persons (Schmidt et al., 2008). The prevalence of posttraumatic symptoms that do not meet the full criteria for PTSD is likely even higher; studies have indicated that up to 30% of women view their childbirth experience as traumatic and exhibit some PTSD symptoms (Grundström et al., 2022). In this context, the intensity and characteristics of CB-PTSD symptoms in a war setting depend on many factors that need to be explored in further studies (i.e. intensity, duration, and nature of hostilities) especially in perinatal women, where research remains scarce (Rodríguez-Muñoz et al., 2025). Our results partially resonate with this literature by showing descriptively higher CB-PTSD burden in displaced groups, while also indicating that, in this Ukrainian perinatal sample, the magnitude of displacement-related differences is modest once other war-related stressors and resource constraints are considered. This reinforces the idea that the displacement context (e.g. legal status, access to services, social support, and safety) may be more relevant for CB-PTSD risk than displacement status *per se*.

With respect to the second aim, the hierarchical regression analyses provided a more fine-grained picture of factors associated with CB-PTSD scores. In line with previous work on perinatal mental health in adversity settings, the present findings highlight the role of lack of resources, perceived quality of healthcare received, diminished emotional stability, war-related disruption in daily life, and neonatal intensive care experiences as key factors of increased CB-PTSD. Lack of resources was consistently associated with higher CB-PTSD scores across all models indicating that women who reported at least one lacking resource experienced greater symptom severity. This supports the notion that material and social deprivation may amplify the impact of traumatic childbirth experiences and ongoing war-related stress.

Neonatal intensive care unit (NICU) admission of the child also emerged as a robust correlate of higher CB-PTSD scores across models, highlighting the central role of neonatal complications and intensive care admissions in shaping mothers' traumatic appraisal of childbirth in this war context. Perceived quality of healthcare before and after childbirth was another significant factor, indicating that women who experienced deterioration in care reported more intense CB-PTSD related symptoms. This finding underscores the importance of respectful, woman-centred, and continuous care during childbirth, even in resource-constrained or rapidly changing healthcare systems. These factors were also identified in previous studies as important elements in stress, trauma or mental health outcomes (Grand et al., 2024; Frankham et al., 2024; Krupelnytska, Vavilova, et al., 2025; Torlinska et al., 2020). Data indicating an increase in preterm births and lower birth weights, increased mortality among preterms with the birthweight lower than 1000 grams (Arbuzova et al., 2025; Verhnovets et al., 2024) suggest that more infants may require neonatal intensive care, placing additional strain on mothers already burdened by the stress of war.

War-related financial stress and disruption in daily life were also strongly linked to CB-PTSD severity. Women reporting stronger financial strain and greater disruption to everyday routines due to the war displayed higher City BiTS scores, highlighting how chronic, context-level stressors can interact with childbirth-related stress to exacerbate CB-PTSD symptoms. These results echo research showing that economic hardship and instability in daily life are key contributors to mental health problems among populations affected by armed conflict and displacement. It is important to notice that displacement often entails abrupt separation from familiar environments and networks, loss of extended family support, and the need to adapt to new legal, linguistic, and cultural contexts, all of which can undermine a woman's sense of safety and predictability during pregnancy and the postpartum period (Blackmore et al., 2020; Bogdanova, 2022; Chrzan-Dętkoś et al., 2022). In addition, displaced women are more likely to experience financial hardship, unstable housing conditions, and difficulties accessing consistent, respectful perinatal care (Artyomenko et al., 2025; Baumann & Kelly, 2022; Krupelnytska & Morozova-Larina, 2025). These cumulative stressors can intensify perceptions of threat during pregnancy and childbirth, limit opportunities for shared decision-making, and reduce the availability of supportive relationships, thereby heightening vulnerability to CB-PTSD symptoms (Ayers et al., 2018; Chabbert et al., 2021; Kranenburg et al., 2023).

Emotional stability can be conceptualised as the inverse of neuroticism, reflecting a lower tendency to experience negative emotions and a greater resilience to stress (Mader et al., 2023; Mann et al., 2021). In this sense, our results showed that lower emotional stability was associated with higher CB-PTSD scores, consistent with evidence suggesting that psychological

vulnerability amplifies the impact of environmental stress (Camara et al., 2025; Lücke et al., 2024). It is worth mentioning that multicollinearity diagnostics (VIFs around 1–1.3) indicated that emotional stability and CB-PTSD were not collinear to a problematic degree.

Evidence from prospective and meta-analytic studies suggests that neuroticism may be understood as a pre-trauma vulnerability factor. In a prospective study of 1,007 young adults followed over ten years, baseline neuroticism significantly increased the risk of developing PTSD after trauma exposure, indicating that neuroticism preceded PTSD onset (Breslau & Schultz, 2013). Consistent with this, a meta-analysis of 19 studies across diverse trauma types showed that temperamental traits related to emotional reactivity and instability were risk factors for PTSD, whereas emotional stability emerged as a protective factor (Cyniak-Cieciura & Zawadzki, 2021). At the same time, neuroticism is associated with heightened stress reactivity and slower autonomic recovery (Yin et al., 2024), suggesting that PTSD may further amplify neuroticism-like emotional patterns over time, thereby increasing vulnerability to prolonged stress.

Considering the second aim of this study, across the hierarchical models, displacement status showed a relatively modest and only partially consistent association with CB-PTSD scores: in the initial specification with ND women as the reference group, ID women reported slightly higher CB-PTSD scores than ND women in the sociodemographic model, but these differences were no longer significant once obstetric and war-related stressors were included, and they also disappeared when ED women were used as the reference group. Nevertheless, this result may indicate that displacement status functions more as a marker of exposure to multiple adversities than as a stand-alone risk factor. In other words, displaced women could be more vulnerable to CB-PTSD because they experience a higher burden of contextual and war-related stressors, even if displacement status itself shows a weaker independent effect in adjusted models. Our results suggest that primary factors influencing CB-PTSD among Ukrainian women may be rooted in access to medical care, the quality and stability of social support networks, and exposure to contextual psychosocial stressors, rather than geographic location per se (Chrzan-Dętkoś, Liakea, et al., 2026; Krupelnytska, Vavilova, et al., 2025; Rodríguez-Muñoz et al., 2023). Many cultural and psychosocial variables that could interact with the displacement status were not measured in our study. In contexts of armed conflict, disruptions in maternal healthcare services, the loss of social safety nets, and persistent insecurity may affect both internally displaced women and those relocated abroad, particularly when their access to protective resources remains compromised (Birhan et al., 2023; Bogdanova, 2022; Chrzan-Dętkoś et al., 2022). This places greater importance on practical determinants – such as access to medical and social support, resource availability, and exposure to violence – rather than on country borders themselves (Hollander et al., 2017; Kismödi & Pitchforth, 2022). Therefore, heterogeneity in medical, social, and humanitarian support across locations may blur the effect of displacement status as an independent variable, underscoring the primacy of context-specific factors in maternal mental health during armed conflict (Krupelnytska, Morozova-Larina, et al., 2025; Makango et al., 2023; Rodríguez-Muñoz et al., 2025).

From a conceptual standpoint, these findings suggest that displacement status may operate as a proxy for the accumulation of adverse experiences (e.g. resource loss, healthcare disruption, safety threats) rather than as a direct factor in CB-PTSD. Interventions and policies that focus solely on legal or geographical categories (e.g. refugee vs. non-refugee) may therefore overlook non-displaced women who are exposed to comparable levels of war-related and perinatal stress and who also might present an elevated CB-PTSD vulnerability.

This pattern is consistent with the idea that chronic or cumulative exposure to threat and loss can foster dissociative responses and reliance on avoidance as coping strategies, which in turn might be expressed with an increased likelihood of CB-PTSD symptoms (American Psychiatric Association, 2022; Chrzan-Dętkoś et al., 2022; Rodríguez-Muñoz et al., 2025). In war situations, motherhood entails a double vulnerability, as the usual challenges of childbirth (labour experience, expectations regarding the baby, fatigue, new routines, body changes) are compounded by conflict-specific stressors such as persistent threat, displacement, disrupted social support, and reduced access to perinatal healthcare (Keasley et al., 2017; Rodríguez-Muñoz et al., 2023).

In this sense, a systematic review by Roberts et al. (2017) identified emotional stability and extraversion as the personality traits most responsive to therapeutic interventions. Targeting emotional stability may offer an accessible approach for interventions on specific CB-PTSD symptoms. Interventions that enhance emotion regulation skills, such as mindfulness-based approaches, cognitive–behavioural strategies targeting maladaptive appraisals, group-based stress management programmes, physical activity, and sleep-focused strategies (Almenräder et al., 2025; Bleidorn et al., 2020; Hanley et al., 2019) could be offered to postpartum mothers as evidence-based, offering small-to-moderate and durable reductions in neuroticism. However, it is important to note that these studies were conducted in safe and stable environments, where basic needs are largely ensured. In contexts of war and chronic threat, recommendations such as sleep hygiene practices or outdoor physical

activity may have limited feasibility due to air-raid alarms, ongoing danger, displacement, loss of electricity or heating, and the cumulative burden of daily survival stressors (Morganstein et al., 2022; WHO, 2024). Under such conditions, stress and uncertainty may overwhelm individual regulatory capacities, constraining the applicability of standard interventions as has been observed in non-war-affected conditions.

The generalisability of these findings is constrained by the characteristics of our sample. Participants were recruited through online channels and tended to be highly educated, mostly partnered, and sufficiently resourced to complete a web-based survey, which likely underrepresents more socioeconomically disadvantaged women and those with limited digital access. As a result, the prevalence and severity of CB-PTSD symptoms observed here may differ from those in women facing greater structural barriers or more severe deprivation. Furthermore, the sample is restricted to Ukrainian perinatal women who remained in Ukraine or resettled in specific European host countries during the current war. Caution is therefore needed when extrapolating to other cultural contexts, to displaced women in different regions, or to perinatal populations affected by other types of crises. Rather than providing nationally representative estimates, our findings should be viewed as evidence on conflict affected Ukrainian women engaged with perinatal and psychosocial support systems, and as a basis for hypothesis generation in future, more representative and longitudinal studies.

Although the present study has several limitations, it also reflects the substantial methodological and ethical challenges of conducting perinatal mental health research in an active war context. In such settings, recruiting large, probabilistic samples or implementing more controlled designs is often unfeasible, and researchers must prioritise participant safety, minimise burden, and work within unstable service and communication infrastructures.

Taken together, our findings suggest that lack of resources, greater war-related disruption in daily life, greater financial stress, admission to NICU, lower quality of healthcare received, and lower emotional stability were more associated with higher CB-PTSD levels in the context of an armed conflict. Although our cross-sectional data do not allow causal inferences, the pattern observed underscores the particular vulnerability of perinatal women to CB-PTSD in conflict-affected settings and highlights the need for trauma-informed and socially responsive perinatal care.

4.1. Limitations and future research

Several limitations should be considered when interpreting these results. First, the cross-sectional design precludes conclusions about the directionality or causality of the associations observed between displacement, contextual factors, and CB-PTSD. Longitudinal studies are needed to clarify the long-term course of trauma symptoms among women exposed to armed conflict during the perinatal period (Dikmen-Yildiz et al., 2018). Also, because women who experienced perinatal loss or neonatal death were not included, the overall burden of CB-PTSD among war-exposed mothers is likely underestimated, given the high prevalence of CB-PTSD following perinatal loss.

Second, all data were self-reported, which may introduce information, reporting, and recall biases, particularly for sensitive mental health outcomes and potentially stigmatising experiences, and retrospective assessments of childbirth and trauma may be influenced by the current psychological state (Weiss & Marmar, 1997). Although recruitment used multiple channels, including refugee support centres and national networks, the sample was predominantly highly educated, which may limit generalisability to more socioeconomically vulnerable mothers.

Third, the two-item emotional stability subscale of the TIPI showed only moderate internal consistency (Eisinga et al., 2013; Thørrisen et al., 2023). While its brevity facilitates rapid screening in conflict-affected settings, it likely underestimates the complexity of personality dimensions relevant for trauma resilience; thus, findings involving personality constructs should be interpreted with caution. Future research should employ more comprehensive personality measures, complement self-report with clinical interviews and objective medical records, and prioritise intervention studies to test trauma-informed perinatal care, targeted psychosocial support, and structural humanitarian interventions in both Ukraine and host countries.

Fourth, the relatively small size of the internally and externally displaced subgroups, together with the low number of women meeting full CB-PTSD diagnostic criteria, might have reduced the probability of detecting moderate between-group differences in diagnostic prevalence.

Finally, the exact time elapsed since childbirth or the infant's age was not collected due to ethical and safety considerations. As a result, our cross-sectional findings cannot distinguish between resilient, recovering, chronic, or delayed CB-PTSD trajectories (i.e. Dikmen-Yildiz et al., 2018), and future longitudinal research with detailed timing information is needed to clarify the course of childbirth-related PTSD among conflict-affected perinatal women.

4.2. Practical implications

Despite these limitations, the findings have important implications for perinatal care in conflict-affected settings. First, the associations between CB-PTSD and perceived deterioration in perinatal care highlight

the need to safeguard respectful, woman-centred, and trauma-informed care practices even when health systems are under strain. This includes clear communication, shared decision-making where possible, and efforts to preserve continuity of care and birth preferences within the constraints imposed by the war.

Second, the strong links between CB-PTSD, lack of resources, and financial stress suggest that perinatal mental health interventions should be integrated with social and economic support measures. Providing targeted assistance – such as financial aid, housing support, access to healthcare and medications, and practical help to obtain baby products – may reduce the cumulative burden of stress that contributes to CB-PTSD. Collaborations between health services, social services, and humanitarian agencies are therefore crucial.

Third, women whose infants require NICU admission should be considered a priority group for psychosocial support. Screening for CB-PTSD symptoms, providing psychoeducation on trauma reactions, and offering brief, accessible interventions (including telehealth or group-based formats) could be especially valuable in this subgroup. Fourth, given the role of emotional stability and war-related stressors, interventions that enhance coping skills, emotion regulation, and stress management may help buffer the psychological impact of childbirth under threat. However, such individual-level strategies should complement, and not substitute, structural efforts to improve safety, resources, and healthcare quality.

Finally, the fact that displacement status did not emerge as a strong independent predictor once other variables were controlled suggests that support should be guided by assessed needs and exposures rather than by formal displacement labels alone. Both displaced and non-displaced women who face severe financial strain, unstable living conditions, disrupted care, and high war-related stress may require similar levels of attention and intervention. Programmes that adopt a needs-based rather than status-based approach are likely to be more equitable and effective in reducing CB-PTSD vulnerability among conflict-affected perinatal women.

5. Conclusions

This study contributes to understanding CB-PTSD among Ukrainian perinatal women living in a war context by examining both displacement status and associated sociodemographic, obstetric, and war-related psychosocial factors. While dissociative symptoms were more frequent among externally displaced women, overall CB-PTSD severity was more strongly linked to lack of resources, neonatal intensive care admission, perceived deterioration in perinatal care, financial and daily-life stress, and lower emotional stability than to displacement status alone. These findings highlight how war-related medical, psychological, and social stressors exceed traditional perinatal risk factors, revealing the complex interplay between displacement, personality traits, and contextual adversities.

Author contributions

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Ethics approval and consent to participate

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Data availability statement

The main study protocol can be seen in Rodríguez-Muñoz et al. (2023). https://doi.org/10.3389/fpsyg.2023.1152478. The preregistration is available in Clinicaltrials.gov under registration number NCT05654987. The authors may be asked for any supplementary information if necessary.

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