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War in Ukraine vs. Motherhood: Mental health self-perceptions of relocated pregnant women and new mothers

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Abstract

Background The Russian military's carnal crimes render certain Ukrainian areas uninhabitable. As a result, a significant portion of the population is experiencing stress-related issues caused by hostilities and forced displacement. This research aimed to examine the self-assessed mental health of pregnant women and new mothers (PNM) who faced relocation.

Methods This report presents findings from a study conducted as part of the Perinatal Mental Health for Refugee Women (PMH-RW) Project. This cross-sectional study used data from 191 PNM who are either internally displaced persons (IDP) or refugees (REF).

Results A higher number of REF than IDP were from the capital, but fewer from rural communities, and new mothers were more likely to hail from major cities than pregnant women. The discrepancy in migration options likely causes the frequent relocation of some groups to inadequately equipped areas, thereby increasing their vulnerability. For example, REF experienced far less pregnancy complications than IDP. The Gini coefficient of 0.153 suggests minor income inequality among the respondents. However, there is a stark contrast between this relatively low inequality and the substantial reports on worsened financial conditions post-invasion. This finding underscores the significant impact of war-related financial instability on the perceived distress of pregnant women and new mothers, with financial burdens emerging as a primary predictor of their distress.

Conclusion The financial burden and socio-economic background of pregnant and new mothers during wartime migration can define their mental health resilience. The inconsistent availability of essential resources caused by war-time economic woes significantly influences the perceived well-being of PNM.

Keywords Sociodemographics, Wartime, Relocation, Maternal health, Motherhood, Women

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Introduction

The ongoing war in Ukraine has profoundly impacted various facets of societal life, specifically mental health. War-related stressors, i.e., air-raid alarms and explosions, significantly increased the anxiety of Ukrainians, negatively affected their mental health, and also caused the remission of somatic symptoms [40]. Pregnant women and new mothers (PNM) are among the most highly susceptible to various stressful factors engendered by warfare, as noted by Chrzan-Detkoś et al. [12]. Such risk factors can include exposure to violent and traumatic events such as explosions, severe restrictions on personal freedom, acts of violence including sexual violence, forced or violent displacement, and torture [23]. All of the listed can be experienced in Ukraine nowadays, as Russians' terror continues. After a year of full-scale war, compared to its initial period, the financial level of Ukrainian family's income and women's opportunities for employment decreased. Still, the role of women in planning family life increased significantly (especially the wives of military personnel) [19].

It should be noted that during pregnancy and the postpartum period, even without particularly traumatic events, women have an increased risk of anxiety and depression [15, 31]. Depression and anxiety manifestation is related to the socio-demographic background of PNM. In a study of Indian pregnant women [8], anxiety and depression scores were higher in the first trimester of pregnancy, age and income were significant contributors to anxiety, and age, gestational age, education level, and qualifications also showed significant associations with depression. Makara-Studzińska et al. [27] obtained similar results in a Polish sample. Symptoms of anxiety were more often experienced by unmarried women, unemployed women, as well as those who rate their housing and financial situation as worse. The most susceptible to depressive symptoms were women with primary education and those who rated their financial and housing situation as worse.

Given the special vulnerability of peripartum women, they are at a higher risk for negative consequences compared to the general population [35]. Pregnant refugee women in Slovenia had higher rates of preterm birth and emergency caesarean section [9]. According to Koen et al. [25], there is a potential association of peripartum trauma with poor maternal foetal outcomes. Keasley et al. [24] have established a relationship between the impact of armed conflict and low birth weight, miscarriages, stillbirths, prematurity, congenital anomalies, and premature rupture of membranes.

To date, there are few publications on the impact of armed conflicts on the mental health of Ukrainian women in the perinatal period. The focus of Punamäki

et al. [29] were Palestinian women from the Gaza Strip during pregnancy, 4 and 12 months postpartum. They were diagnosed with post-traumatic stress disorder (PTSD), depressive, anxiety and dissociative symptoms, as well as complications of pregnancy and subsequent sensorimotor and language development of infants. A study conducted on a sample of Syrian postpartum women indicated a high proportion of women with a high level of postpartum depression (28.2%) [35]. Stevenson et al. [39], analysing the data of 135 studies, singled out the following key factors of perinatal depression: being a recently arrived immigrant, having poor social support, and having a poor relationship with one's partner. In a systematic review, Falah-Hassani et al. [17] also found a higher incidence of postnatal depression among migrant women. In a study of Ukrainian refugees in the Czech Republic, women refugees had 1.77 times higher odds for depression or anxiety than men [21].

After the annexation of Crimea and the occupation of part of Donbas by the Russian Federation in 2014, Ukraine experienced a significant wave of internal displacement. Few studies on internally displaced pregnant women have shown that these women are more prone to premature termination of pregnancy, and exhibit a higher prevalence of somatic diseases compared to non-displaced ones [34]. Additionally, approximately one-third of these women met the criteria for PTSD [4].

The objective of this study is to examine the perceived mental health of PNM who were forced to relocate due to the Russian invasion of Ukraine. The specific research questions addressed are: (1) What are the sociodemographic differences among PNM who have chosen to relocate?; (2) How do relocated PNM assess their mental health and need for medical care?; (3) What are the primary stresses that PNM experience, and what variables impact their self-assessed level of distress?; (4) What are the primary sources of support and which variables can be regarded as protective for the mental health of PNM?; (5) What policy changes can be proposed to ensure that PNM have access to medical care based on findings?

Materials and methods

Study design and participants

This paper presents results from a study conducted as part of the Perinatal Mental Health for Refugee Women (PMH-RW) Project. The study protocol, previously published by Rodríguez-Muñoz et al. [33], guided data collection using the Qualtrics® XM platform on the National University of Distance Education's website (<https://blogs.uned.es/mama/>), from December 1, 2022, to October 1, 2023. The participants were recruited through social media platforms, media outlets, and by members of the COST Action

Research Innovation and Sustainable Pan-European Network in Peripartum Depression Disorder (Riseup-PPD CA18138). Additionally, information about the study was disseminated at refugee assistance centres in Poland. The distribution of study information through multiple channels aimed to reduce potential biases, such as technology acceptance, accessibility, and demographic representation.

The study protocol was approved by the Research Ethics Committee of Universidad Nacional de Educación a Distancia (21-PSI-2022) and the Research Ethics Committee of the Faculty of Psychology of Taras Shevchenko National University of Kyiv (Date: August of 2022, Decision No. 04, Protocol No. 01). Clinical trial registration was completed at ClinicalTrials.gov under identifier NCT04595123). Informed consent was obtained from all respondents in a digital form. Participants were selected based on these criteria: (1) being pregnant or a biological mother to an infant up to 12 months old; (2) being 18 years or older; (3) living in Ukraine during or after the Russian invasion, or being a Ukrainian war REF in the EU since February 24, 2022; (4) consenting to participate.

Of the 734 respondents, 78 were IDP (10.6%), 113 sought refuge in EU countries (15.4%), and 543 stayed in Ukraine (74.0%). This paper focuses on data from 191 PNM who are either IDP or REF, as illustrated in Figs. 1 and 2.

Measures

Data were gathered using the 'Assessment, Care, and Trust – In Pregnant and New Mothers (ACT-PNM)' Questionnaire, as detailed in the research protocol by Rodríguez-Muñoz et al. [33]. This questionnaire was specifically tailored for this study. Comprising 40 items, the ACT-PNM gathers sociodemographic data and assesses perceived mental health impact from the war, serving as a preliminary diagnostic tool, as shown in Table 1.

Data analysis was conducted using R software (version 4.3.2, released October 31, 2023). Authors employed Pearson's Chi-squared test with simulated p -value (based on 2000 replicates), Fisher's exact test, Gini coefficient, ordinal logistic regression modelling with a cumulative link model. Quantitative variables were primarily categorised into meaningful groups based on standard demographic classifications (e.g., education level, marital status). During comparative analysis and modelling, the respondents' migration status was blinded to reduce observer bias. To identify the most robust model, we applied both backward stepwise selection and the enter method for variable inclusion in our conditional logistic regression analysis, which helped minimise model-based biases. All statistical analyses adhered to a common threshold of significance level ($p < 0.05$).

Results

The demographic characteristics of the study population are detailed in Table 2. The Chi-squared test, based on 2000 replicates, underscores substantial disparities in

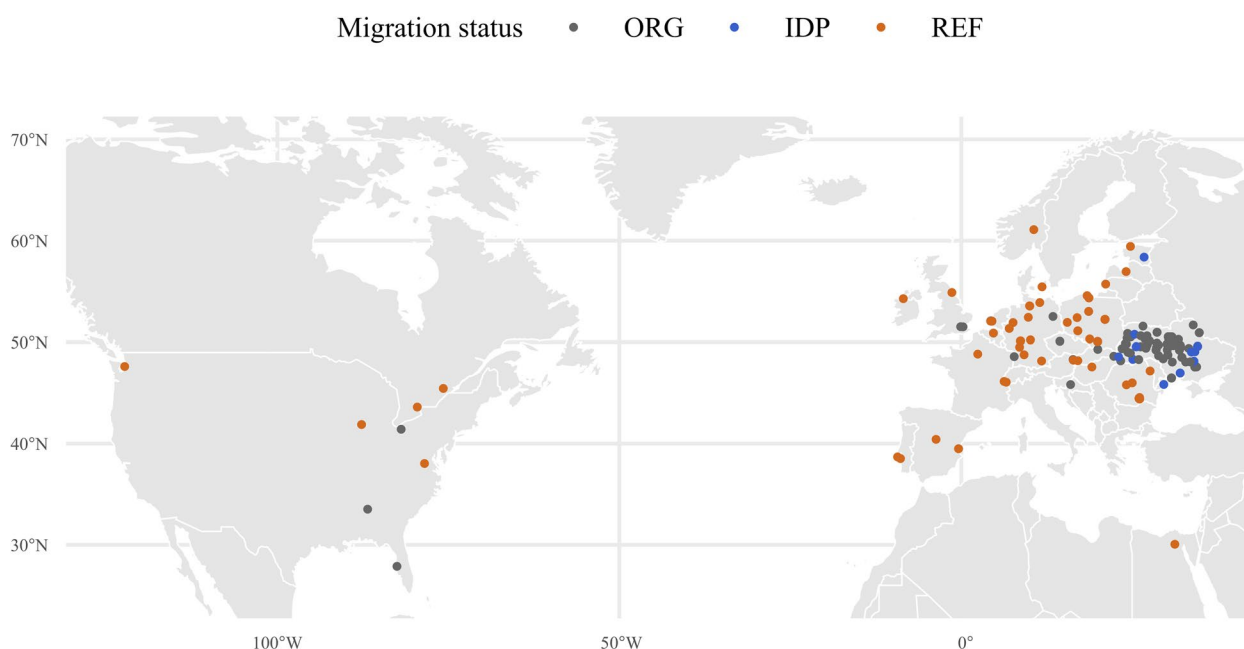


Fig. 1 The visualisation of the participants' place of residence during the survey

Note: ORG represents individuals residing at their original homes

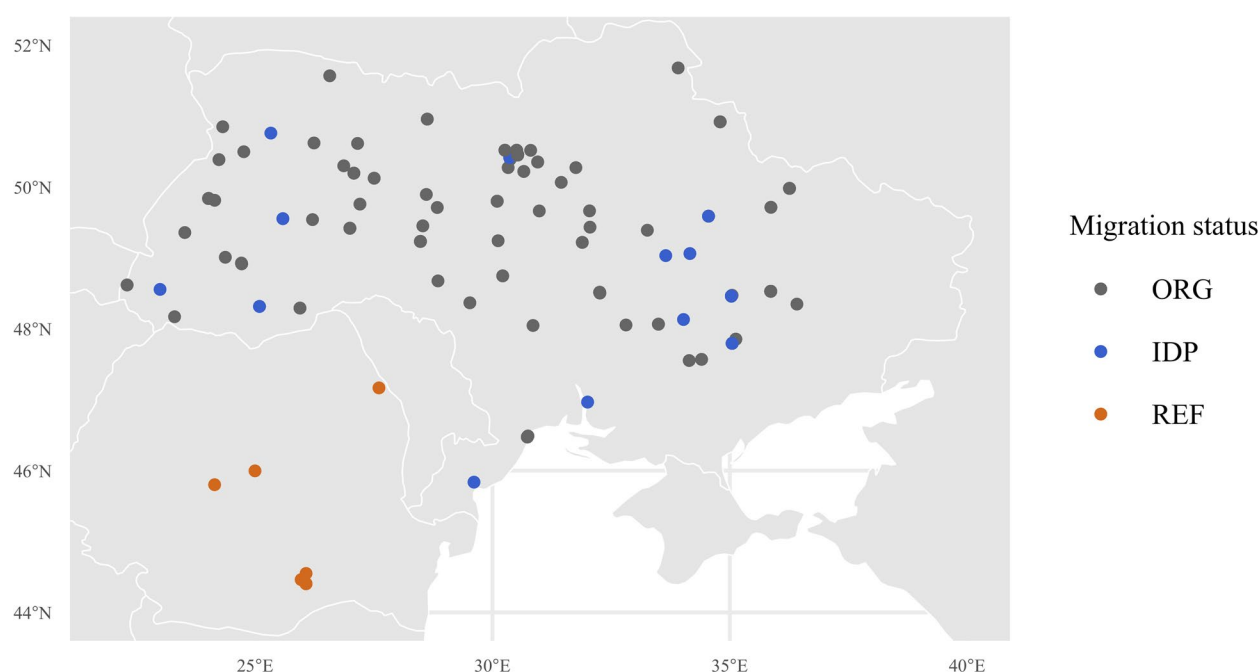


Fig. 2 The visualisation of the migration status of participants located in Ukraine

Table 1 Assessment, Care, and Trust – In Pregnant and New Mothers (ACT-PNM) Items

Item	Answer Type
Sect. "Introduction". Sociodemographic data	
Current residence	Dichotomous
Forced migration	Dichotomous
Education	Multiple choice
Pregnancy status	Dichotomous
Prior pregnancies	Open-ended (num.)
Number of biological children (including miscarriages)	Open-ended (num.)
Number of residents at home	Open-ended (num.)
Marital status	Multiple choice
Co-living with partner	Dichotomous
Sect. "Materials and Methods". War-related impact on mental health	
How did the war affect your mental well-being?	Likert's Scale
In general, how much did the war affect your everyday life?	Likert's Scale
How has the war outbreak changed your stress levels or mental health?	Multiple choice
What is the biggest source of stress due to war right now?	Multiple choice
What are you doing to cope with your stress related to the war outbreak?	Multiple choice
Are you currently receiving treatment for mental health concerns (e.g., depression, anxiety, stress, ADHD, bipolar disorder, eating disorder, or PTSD)?	Dichotomous

the demographic profiles of PNM, based on their migration status as IDP or REF, particularly with regard to their previous places of residence ($\chi^2 = 13.73$, $p = 0.005$). Fisher's Exact Test further confirms these disparities, indicating significant differences in the distribution of previous residence types between groups ($p = 0.003$).

In detail, a larger percentage of REF (25.0%) compared to IDP (14.3%) originated from the capital city. While both groups showed a significant representation from larger cities – 50.0% of IDP and 33.3% of REF – a higher proportion of IDP are associated with this type of area. Conversely, REF had a greater representation from small

Table 2 Comparison of sociodemographic characteristics of PNM groups

Variables	Pregnant		New Mothers		χ^2 (p)
	IDP	REF	IDP	REF	
Respondents, n	22	29	56	84	
Level of education, n(%)	$\chi^2 = 8.55, p = 0.104$		$\chi^2 = 3.16, p = 0.743$		4.45 (0.487)
Incomplete secondary	1 (4.5)	2 (6.9)	1 (1.8)	1 (1.2)	
Full secondary education	4 (18.2)	2 (6.9)	10 (17.9)	8 (9.5)	
Incomplete higher education	3 (13.6)		5 (8.9)	6 (7.1)	
Bachelor	4 (18.2)	11 (37.9)	12 (21.4)	22 (26.2)	
Masters	9 (40.9)	14 (48.3)	28 (50.0)	46 (54.8)	
Scientific degree	1 (4.5)			1 (1.2)	
Marital status, n(%)	$\chi^2 = 1.45, p = 0.933$		$\chi^2 = 1.50, p = 0.705$		4.60 (0.326)
Single	1 (4.5)	1 (3.5)	1 (1.8)	5 (6.0)	
Partnered/Married	14 (63.6)	20 (68.8)	45 (80.4)	64 (76.2)	
Divorced/Separated	6 (27.3)	5 (17.2)	9 (16.1)	13 (15.5)	
Widowed	1 (4.5)	1 (3.5)	1 (1.8)	2 (2.4)	
Other (Unspecified)		1 (3.5)			
N/A		1 (3.5)			
Household relocation status, n(%)	$\chi^2 = 1.34, p = 0.360$		$\chi^2 = 0.69, p = 0.485$		3.79 (0.075)
Relocated with relatives	5 (22.7)	11 (37.9)	24 (42.9)	42 (50.0)	
Relocated without relatives	17 (77.3)	18 (62.1)	32 (57.1)	42 (50.0)	
Place of residence, n(%)	$\chi^2 = 0.09, p = 0.999$		$\chi^2 = 13.73, p = 0.005$		6.19 (0.002)
The capital	5 (22.7)	6 (20.7)	8 (14.3)	21 (25.0)	
Big city	6 (27.3)	9 (31.0)	28 (50.0)	28 (33.3)	
A small town	11 (50.0)	14 (48.3)	7 (12.5)	27 (32.1)	
Village			13 (23.2)	8 (9.5)	
Financial situation before war, n(%)	$\chi^2 = 2.95, p = 0.262$		$\chi^2 = 2.53, p = 0.513$		4.31 (0.255)
Very good	2 (9.1)	7 (24.1)	11 (19.6)	20 (23.8)	
Good enough	13 (59.1)	19 (65.5)	32 (57.1)	52 (61.9)	
Not very good	4 (18.2)	2 (6.9)	3 (5.4)	4 (4.8)	
Very bad				4 (4.8)	
N/A	3 (13.6)	1 (3.5)	10 (17.9)	4 (4.8)	
Financial situation after war, n(%)	$\chi^2 = 3.26, p = 0.635$		$\chi^2 = 4.09, p = 0.423$		2.13 (0.772)
Much better	1 (4.5)			3 (3.6)	
Improved	2 (9.1)	1 (3.4)	2 (3.6)	2 (2.4)	
Unchanged		1 (3.4)		3 (3.6)	
Somewhat worsened	7 (31.8)	13 (44.8)	19 (33.9)	30 (35.7)	
Much worsened	4 (18.2)	6 (20.7)	16 (28.6)	23 (27.4)	
N/A	8 (36.4)	8 (27.6)	19 (33.9)	23 (27.4)	

towns (32.1% compared to 12.5% for IDP) and fewer REF originated from villages (9.5%) compared to IDP (23.2%), indicating a more rural background among the IDP group. Additionally, there are a difference in the origins of new mothers compared to pregnant women based on Chi-squares test ($\chi^2 = 6.19, p = 0.002$), which aligns with Fisher's Test results ($p = 0.0004$). New mothers more commonly came from big cities (40%) and less frequently from small towns (24.3%), whereas pregnant women

were more likely to come from small towns (49%) and less from big cities (29.4%).

Predominantly, individuals in both categories are either partnered or married (74.8%), with no significant differences ($p = [0.326; 0.933]$). Similarly, there were no significant differences between PNM who relocated with relatives and those who relocated alone ($p = [0.075; 0.485]$). This suggests that family ties likely remain stable despite the challenges of displacement.

Furthermore, there is a shift in education level among the discussed sample in general ($p = [0.104; 0.743]$) with prevalence of respondents participating with completed higher education – bachelor's (25.7%) or master's degree (50.7%) as well. Moreover, the Chi-squared test indicates no significant differences in financial status for different groups both before and after the Russian invasion ($p = [0.255; 0.772]$). This finding is further underscored by a low Gini Coefficient of 0.153, indicating minimal inequality among respondents. The substantial proportion of individuals reporting worsened financial conditions after full-scale invasion among all subgroups – 61.7% from general sample – provides a stark contrast, pointing to the severe economic difficulties faced by war affected PNM.

The analysis of whether the current pregnancy is the first one for the respondents shows a marginal trend towards significance ($p = 0.082$) suggesting a possible variation in family planning or birth intervals that does not reach conventional levels of statistical significance, but is still shaping migration processes (See Table 3). There is lack of data on other types of pregnancy despite singleton – indicated for only 6.3% of respondents – which reveals possible limitations of presented design. Still we can assume that the incidence of complications during pregnancy presents a stark contrast. Particularly, among new mothers, where the chi-square values reveal a significant difference ($\chi^2 = 13.66, p = 0.004$). New mothers REF had significantly fewer complications compared to IDP new mothers. Concerns regarding medical care access were primarily reported only by new mothers that had

to refuge from Ukraine (3.6%). The ratio of chosen main stressors, highlighted at Fig. 3, shows prosocial tendency among the PNM population. Naturally, REF are less likely to refer to safety issues (12.4%) compared to IDP (33.3%). Still REF are more often worried about the war outcomes on relatives (35.7%) and community (27.2%), unlike the IDP (30.2%, 15.9%, respectively).

Though PNM subgroups assess war's impact on mental health differently, they seek mental health care similarly (See Table 4). Slight differences among new mothers and pregnant women regarding this question with p -values reaching for significance threshold ($p = 0.059$) are not supported by Fisher's Exact Test results ($p = 0.083$), indicating dispersion disproportion among groups. 92.9% of IDP and 91.4% of REF as well stated that they did not intend to seek help. The highest percentage of women who received treatment due to mental health problems was among REF (7.6%); in contrast to IDP (4.8%).

Figure 4 represents preferred ways of coping with the stressful impact of war. PNM selected sociable contacts and activities more often, although their sociability may be predicted by multiple routes. The REF subgroup primarily focused on 'being in touch,' as noted by one of the participants, saving the ability to interact and stay up-to-date and informed. REF most commonly cope by chatting with peers (30.5%), spending time on social media (14.5%), and monitoring international news (11%). IDP, unlike REF, preferred prosocial coping including aiding others (4.3% compared to 2.1% among REF), communicating with peers (30.1%) or other PNM (16.2%), and decreasing social media usage (10.0%).

Table 3 Comparison of birth-related characteristics of PNM groups

Variables	Pregnant		New Mothers		χ^2 (p)
	IDP	REF	IDP	REF	
Respondents, n	22	29	56	84	
Pregnancy type, n(%)	$\chi^2 = 0.08, p = 0.999$		$\chi^2 = 1.66, p = 0.729$		0.91 (0.893)
Singleton	21 (95.5)	27 (93.2)	49 (87.5)	81 (96.4)	
Twin		1 (3.4)	1 (1.8)	2 (2.4)	
N/A	1 (4.5)	1 (3.4)	5 (8.9)	1 (1.2)	
Other Children	$\chi^2 = 3.47, p = 0.077$		$\chi^2 = 3.41, p = 0.079$		3.48 (0.082)
First child	16 (72.7)	14 (48.3)	35 (62.5)	43 (51.2)	
Not first	5 (22.7)	14 (48.3)	17 (30.4)	41 (48.8)	
N/A	1 (4.5)	1 (3.4)	4 (7.14)		
Complications	$\chi^2 = 0.34, p = 0.911$		$\chi^2 = 13.66, p = 0.004$		6.74 (0.529)
None	16 (72.7)	20 (68.9)	25 (44.6)	55 (65.5)	
One	3 (13.6)	5 (17.2)	11 (19.6)	16 (19.1)	
Two	2 (9.1)	4 (13.8)	8 (14.3)	8 (9.5)	
Three or more	1 (4.6)		11 (19.6)	4 (4.7)	
N/A			1 (1.8)	1 (1.2)	

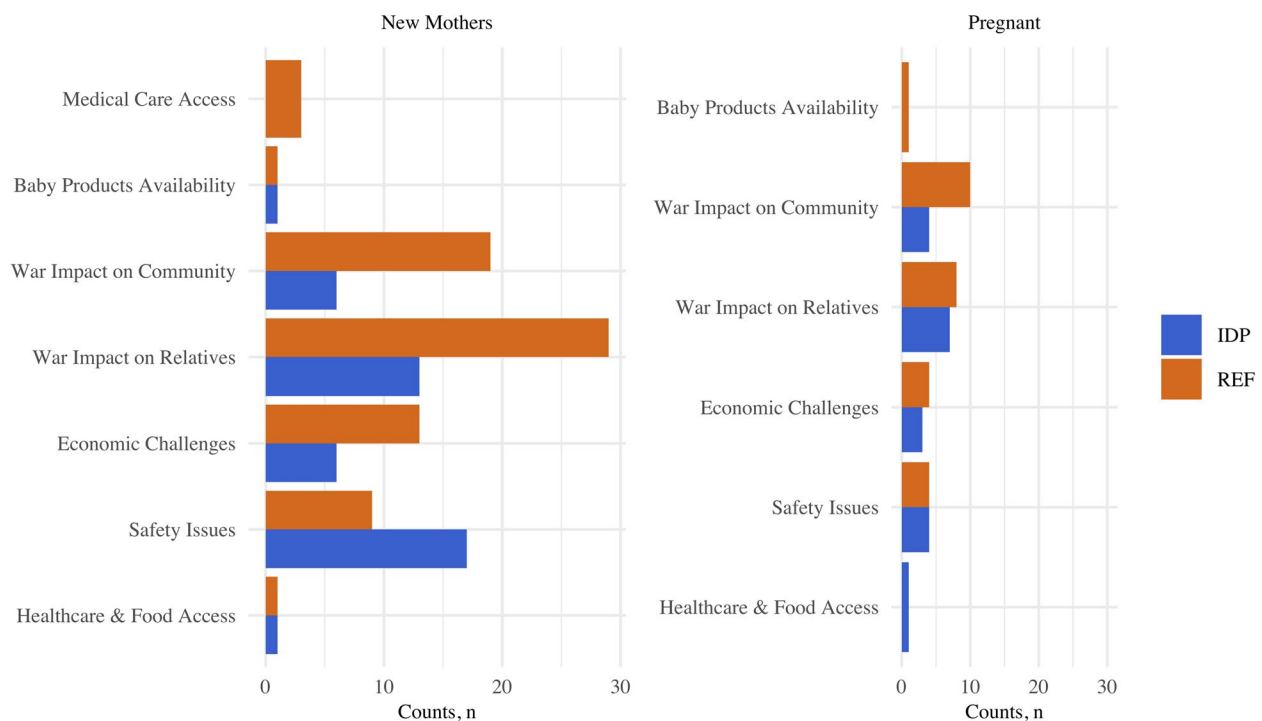


Fig. 3 The comparative diagram of perceived main stressors among participants

Table 4 Comparison of mental health seeking behaviour among PNM groups

Variables	Pregnant		New Mothers		χ^2 (p)
	IDPs	REFs	IDPs	REFs	
Receiving mental health care, n(%)	$\chi^2=0.16, p=0.999$		$\chi^2=2.69, p=0.265$		1.55 (0.059)
Yes	2 (9.1)	2 (6.9)	1 (1.8)	6 (7.2)	
No	17 (77.3)	26 (89.6)	42 (75.0)	70 (83.3)	
I don't want to answer			2 (31.6)	1 (1.2)	
N/A	3 (13.6)	1 (3.5)	11 (19.6)	7 (8.3)	

IDPs may have been more focused on *'being present,'* as a means of restoration.

Pregnant women tend not to use substances to cope with stress, whereas 3.1% of new mothers prefer this option. Pregnant women more frequently opt for social interactions, while new mothers are more inclined to choose eating comfort food (13.4%), communicating with other pregnant women or parents (18.6%), and increasing time spent on social networks (10.3%). Additionally, new mothers are less likely to choose coping strategies that enhance self-care (such as sleep, meditation, sports, or reading) compared to pregnant women (4.1% compared to 11.2%).

An ordinal logistic regression model was fitted using the cumulative link model to assess the predictors of

self-reported distress levels (See Table 5). The absence of the Hauck-Donner effect in any of the estimates indicates that the coefficient estimates are reliable. The nature and proportion of missing data for each variable of interest are illustrated in Fig. 5. Based on this model, we can assume main perceived stressors in post-invasion experiences of PNM from Ukraine. Concerns regarding the financial consequences of war on respondents' households were significantly associated with higher levels of general distress in daily life ($\Theta=0.382, p<0.001, OR=1.465$). The perceived stress from financial burdens potentially linked to participants' original place of residence, as detailed in Figs. 6 and 7. Additionally, respondents who reported negative changes in their financial situation experienced a 75.4%

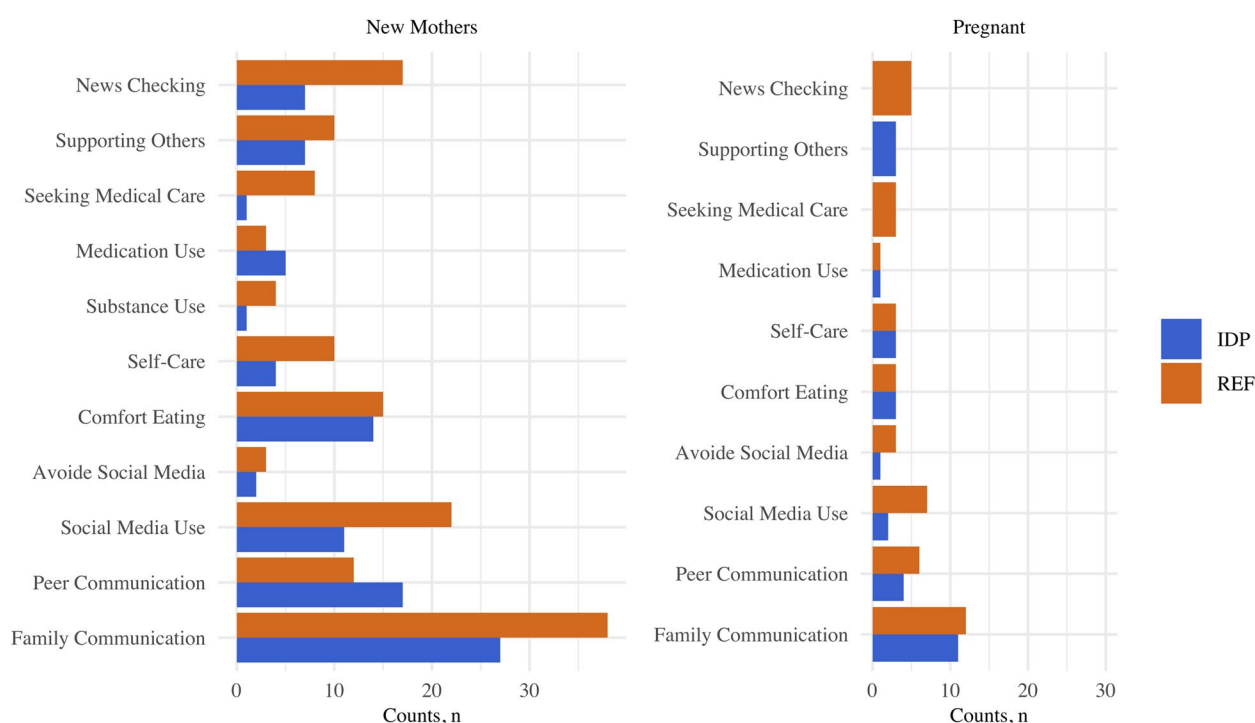


Fig. 4 The comparative diagram of coping strategies among participants

Table 5 Ordinal modelling results for perceived distress level predictors

Variable	Estimate	Std. Error	z value	Pr(> z)	P-value
Financial situation changes	0.562	0.169	3.320	0.001	< 0.001
Finances-related stress	0.382	0.055	6.967	3.23e ⁻¹²	< 0.001
Lack of support sources	0.143	0.052	2.727	0.006	< 0.01
Disruption of social support network	0.313	0.051	6.130	8.81e ⁻¹⁰	< 0.001
Household relocation status	0.473	0.185	2.550	0.011	< 0.01
Original place of residence	0.249	0.060	5.121	0.001	< 0.001

increase in perceived distress ($\beta=0.562$, $p<0.001$, $OR=1.754$).

Higher ratings of lacking support sources were also associated with increased levels of tension ($\beta=0.143$, $p<0.01$, $OR=1.154$), indicating that the odds of reporting higher distress levels rose by 15.4% for each unit increase in the lack of support sources. Similarly, each one-level increase in the assessment of disruption in the social support network was associated with a 36.7% increase in distress levels ($\beta=0.313$, $p<0.001$, $OR=1.367$). Additionally, the actual presence of relatives in the new household ($\beta=0.473$, $p<0.01$, $OR=1.605$) was associated with a 60.5% increase in distress levels. From this point, we can assume that social support as well as financial stability could possibly serve as protector factors of wartime

related distress in PNM ($OR>1$). Moreover, based on the cumulative link model, the effect of various predictors directly on respondents' perceived mental well-being was evaluated (see Table 6). Concerns about a child's health due to the war were a primary negative predictor of mental well-being ($\beta=1.095$, $p<0.001$, $OR=0.334$). This indicates that those with concerns about their child's health due to the war are 66.4% more likely to report a worsening in mental well-being and are likely more ready to relocate. The place of origin residence ($\beta=0.780$, $p<0.001$, $OR=0.458$) was also a predictor of well-being. Those who had migration status of refugee were 54.2% of rose in distress levels, as visualised in Fig. 8.

Additionally, individuals who encountered difficulties accessing medical care ($\beta=0.679$, $p<0.05$,

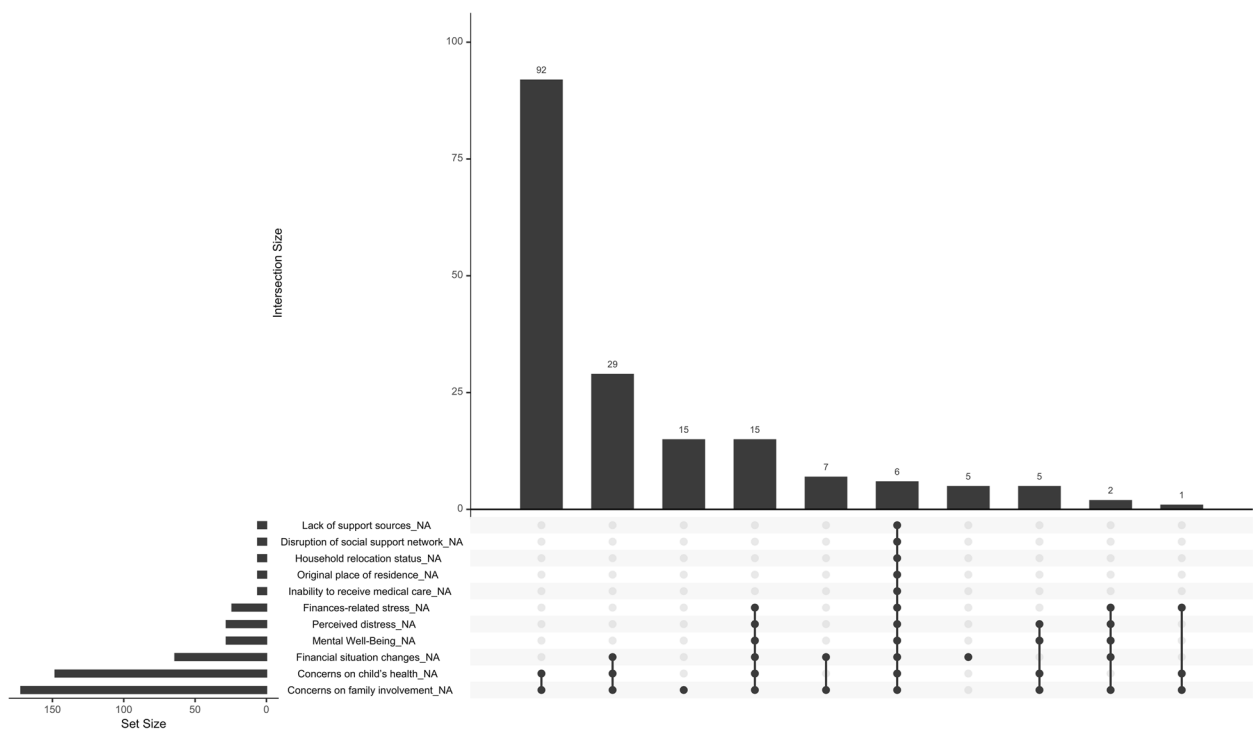


Fig. 5 The UpSet plot visualising missing data patterns across variables of interest



Fig. 6 The visualisation of perceived financial impact of warfare among participants based on their place of residence during the survey

$OR=1.971$) and those who expressed concerns about potential changes in family support ($\phi=0.630$, $p<0.05$, $OR=0.533$) reported lower well-being following the full-scale invasion. In contrast, relocation with or without

relatives did not have a significant impact on well-being ($\phi=0.099$, $p>0.05$, $OR=1.104$). The odds ratio for the access to medical care variable, contrasting with concerns about changes in family support, was greater than

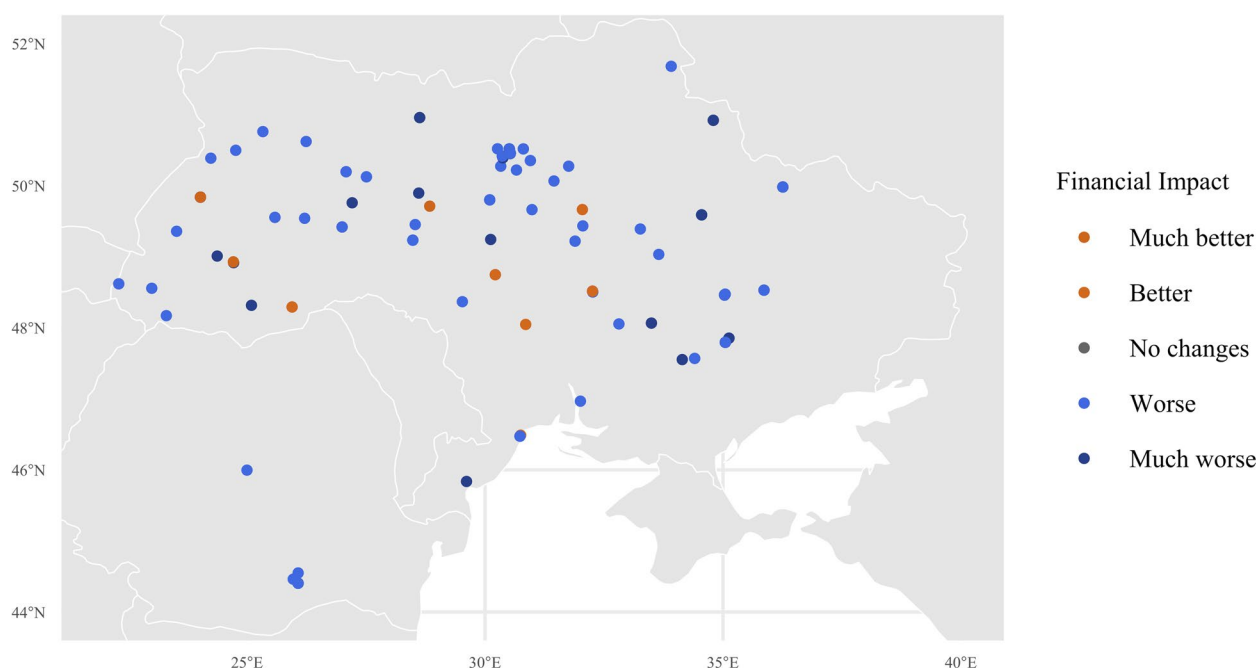


Fig. 7 The visualisation of perceived financial impact of warfare among participants located in Ukraine based on their place of residence during the survey

Table 6 Ordinal modelling results for perceived mental well-being predictors

Variable	Estimate	Std. Error	z value	Pr(> z)	P-value
Concerns on child's health	1.095	0.314	3.489	0.001	< 0.001
Inability to receive medical care	0.679	0.294	2.309	0.021	< 0.05
Concerns on family involvement	0.630	0.308	2.044	0.041	< 0.05
Original place of residence	0.780	0.147	2.439	0.041	< 0.001

1, suggesting that the perceived stressors associated with these changes were predominantly related to family support, while access to medical care could serve as a protective factor for PNM during wartime. Overall, the regression analysis indicates that financial burdens, the original location of the household, concerns about a child's health, access to medical care, and expectations regarding future family involvement in childcare were significant predictors of perceived war-related distress, ultimately contributing to reports of deteriorated mental health.

Discussion

The study identified disparities in the demographic and mental health-related profiles of pregnant women and new mothers based on their migration status. To the best of our knowledge, this is the first study that focuses on the perinatal mental health of Ukrainian war-affected

mothers who were internally displaced or were refugees in other countries.

Our first research question examined the sociodemographic differences among PNM who chose to relocate. Before the onset of the full-scale war, approximately one in four REF and only about one in seven IDP resided in Kyiv, Ukraine's capital. Additionally, half of the IDP and one-third of the REF women lived in major cities, while REF were more prevalent in towns and IDPs in villages. These differences may reflect varying patterns of displacement and migration among PNM, potentially influenced by socio-economic and conflict-related factors specific to different regions.

At the same time, this variation also reflects post-migration mental health outcomes. There is a substantial body of evidence highlighting the negative impact of wartime events [10] and displacement [22] on women's perinatal health, including mental health (Romanenko et al., 2019). For instance, Syrian REF new mothers have

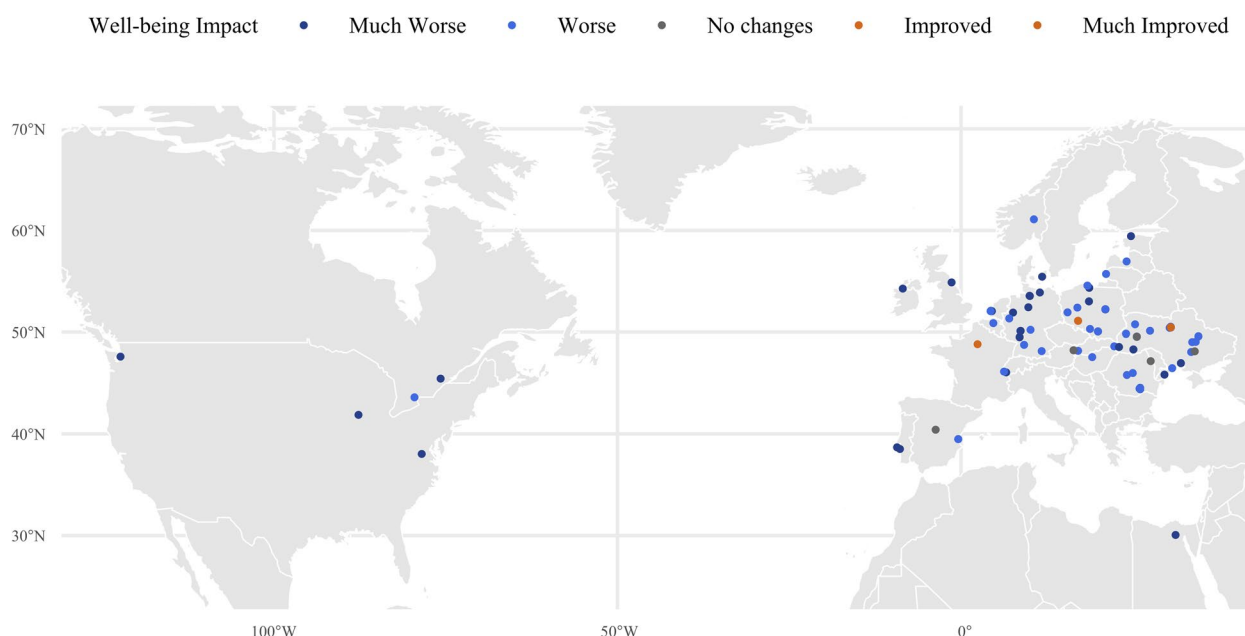


Fig. 8 The visualisation of perceived mental wellbeing changes among participants based on their place of residence during the survey

reported higher rates of Caesarean sections, anaemia, lower newborn weights, and lower APGAR scores compared to other groups of new mothers [3]. Contrary to these findings, our study revealed that REF new mothers had lower complication rates and better health outcomes compared to IDP. While the difference in the presence and number of pregnancy complications between pregnant REF and IDP was not statistically significant, the number of complications among new mothers was significantly higher in the IDP group. This can perhaps be explained by better access to the healthcare system, not affected by air alarms, police hours and other war-related factors.

Additionally, the relatively high educational levels among refugee mothers were noted. Available data indicate that a significant proportion of Ukrainian refugees in Poland possess a favourable educational profile. Despite this, Gromadzki and Lewandowski [20] reported that more than half of refugee workers, compared to only 7% of the local working population, were employed in elementary occupations. As a result, many refugees are working in roles below their qualifications, which can negatively impact their mental health and their ability to provide optimal care for their children.

On the other hand, what is related to our third research question aimed to assess the primary stresses that PNM experiences. The PNM who were forced to flee Ukraine primarily expressed concerns about access to medical care as a source of distress and fewer safety concerns than IDP mothers, which could also affect

their well-being. Although medical care in non-war-affected host countries may be more accessible, the distress in navigating the health system, and the language barrier may be higher. This underscores the need for additional interventions focused on engaging refugee PNM to seek support and information, as they tend to seek help later and experience additional stress due to their migration status and potential cultural differences [12]. Previous studies have underscored the role of stigma, language barriers, and the absence of culturally sensitive practices in deterring mental health-seeking behaviors among refugee women [2, 16, 38]. Policies should include initiatives like hospital-based language classes, as suggested by Qutranji et al. [30]. These classes could serve a dual purpose: improving language proficiency and fostering social support networks among refugee women. Additionally, employing trained interpreters in healthcare settings can further bridge communication gaps, as proposed by Tulli et al. [41]. As noted by Benjamin et al. [7], virtual care can eliminate transportation costs and improve timely access to services, particularly for those in remote or underserved areas. However, the effectiveness of virtual care hinges on addressing technological barriers and ensuring digital literacy among refugee populations. Finally, addressing accessibility issues beyond the healthcare setting is crucial. Based on the work of Salameh et al. [37], five key areas – approachability, acceptability, availability, affordability, and appropriateness – emerge as vital components of effective

healthcare policy. Enhancing knowledge about mental health, reducing cultural stigma, improving healthcare logistics, providing financial support, and offering consistent and focused mental health services are essential steps to ensure comprehensive care for displaced PNM.

Additionally, other important distress for the participants was perceived and real financial burdens. As we can assume from prior studies, their place of original residence could serve as a moderator of distress level, and define their material and mental well-being [1].

It should be noted that a group of Ukrainian internally displaced women was affected by factors related, on the one hand, to displacement, and on the other hand, to war conditions, which even in safe parts of Ukraine affect all citizens. As noted by Romanenko [34], internally displaced PNM have an increased risk of somatic and mental health issues. Moreover, the stress-related states were assessed as risk factors for childbirth and mothering complications [5, 36]. Despite this condition, there were surprisingly no significant differences in mental health help-seeking behaviour among PNM subgroups. The psychological help for IDP in Ukraine is available, with special mobile teams focused on women's mental health (GBV [18]). According to Guerrero et al. [21] study, the increase of depressive and anxiety symptoms among Ukrainian war refugees is accompanied by an alarming lack of recognition of these problems and the low rates of seeking mental health support. Our results and Guerrero et al. [21] study reflect gaps in mental health literacy or maladaptive attitudes related with help-seeking behaviours and migration status among this population, as noted by Daehn et al. [14]

Our fifth research question confirmed the importance of social support and its relation with mental health in pregnant women [6] and new mothers [11]. In our study, we received confirmation of this significant factor in the level of distress of PNM, which, together with financial support, proved to be even more important than the direct impact of military events. Moreover, the research findings indicate that women voluntarily employ coping strategies centred around social communication, including interactions with relatives, friends, and other PNM. This form of coping was identified as a potentially protective factor against war-related distress, consistent with earlier findings reported by Renner et al. [32]. But it should be noted that among both subgroups, pregnant women more often use constructive coping, whereas new mothers more often choose destructive coping. As evidence shows, stress caused by war and displacement and taking care of a baby in war related conditions, can interfere with postpartum depressive states [13, 15]. Therefore, this may cause destructive coping strategies among

mothers who cannot cope with the stressful situation of wartime migration.

The cumulative link model allowed us to indicate the predictors of PNM's mental well-being. Concerns about the child's health because of the war, concerns about future changes in family support, as well as one or more problems with accessing medical care are variables that predict a low level of mental well-being of PNM, who are REF or IDP during the ongoing war. Support from friends, partners, and family are factors that reduce the risk of antenatal depression among pregnant immigrant women [28]. As follows from the results of our study, such support predicts a higher level of mental well-being of PNM. The obtained results specify and confirm the results of the qualitative study of the perinatal experience of Ukrainian women at the beginning of the full-scale war in Ukraine [26]. Among the highlighted in-depth interview's themes were 'Positive attitudes towards the child (or unborn child)', 'Suffering associated with separation from a husband and relatives', 'Family relationships and support during the war', and two themes regarding medical support indicating the importance of this aspect of PNM life: 'Dissatisfaction with medical support during the war', and 'Satisfaction with medical support during the war'. Overall, this study demonstrates the importance of social support for PNM, ensuring their confidence in their financial well-being to reduce perceived stress levels, as well as a sufficient level of support for their children's health and access to medical care in conditions of war and migration.

Limitations

There are several limitations to this study. The PNM sample is relatively small in size. Specifically, it only included PNM having resided in non-occupied territories of Ukraine. This may limit the generalizability of our findings to the broader war-affected population. The sample size also raises concerns about the statistical power needed to capture subtle differences between subgroups, which should be addressed in future research with larger and more diverse samples. Additionally, the majority of female refugees in the sample held bachelor's or master's degrees, thus the results primarily pertain to this subgroup of PNM.

The study's design did not specify detailed demographic information, such as concrete age, place of original residence, pre- and post-war financial status, and specific data on access to medical care facilities were not fully captured. These omissions were due in part to concerns about participant confidentiality and security, particularly for those with family members still residing in

temporarily occupied territories. This limitation reflects the challenges of data collection in wartime realities.

There was no comprehensive model linking the discussed factors with women's self-evaluated mental health. Future studies should consider employing longitudinal designs and more advanced modelling approaches to better capture these relationships. Lastly, although the study emphasised contextual factors as key protective elements, other significant predictors, such as child health and family involvement, were only briefly addressed. We propose these aspects as direction for further research.

Conclusion

It found that despite safety concerns, several demographic and contextual factors may influence the mental well-being of PNM from Ukraine who are faced with relocation. Social support network, availability of medical care and support sources, financial wealth, and socio-economic background can serve as protective factors of perceived war-related distress. At the same time, the child's health and family involvement concerns were identified as primary stressors and perceived threats for displaced PNM. The level of complications during pregnancy in the group of IDP new mothers turned out to be significantly higher than among REF new mothers. The distress with the availability of medical care in host countries for REF may be lower, compared to such care in their home country. Professionals who provide care for PNM should consider that concerns about the health of the child, as well as challenges and distress with access to health care, are the main variables that predict low levels of mental well-being in these women.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12884-025-07346-0>.

Supplementary Material 1.

Disclosure of interest

This paper is part of the COST Action Research Innovation and Sustainable Pan-European Network in Peripartum Depression Disorder (Riseup-PPD CA18138) and was supported by COST under COST Action Riseup-PPD CA18138. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' contributions

L.K. did the study design, coordinated the study, recruited participants and drafted the manuscript, A.V. did the study design, recruited participants, analyzed the study data, edited the manuscript, N.Ya. did the study design, analyzed the study data, edited the manuscript, M.Ch. recruited participants, edited the manuscript, O.M.-L. did the study design, recruited participants,

edited the manuscript, A.U. recruited participants, edited the manuscript, M.F.R.-M. recruited participants, edited the manuscript.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Competing interests

The authors declare no competing interests.

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Received: 28 June 2024 Accepted: 18 February 2025

Published online: 08 March 2025

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