The mental health toll of the Russian-Ukraine war across 11 countries: Cross-sectional data on war-related stressors, PTSD and CPTSD symptoms

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ABSTRACT

Exposure to war is a severe traumatic experience with disastrous mental health effects. This study examined the mental health among 5,560 residents in 11 countries worldwide at different geographic distances from the epicenter of the Russian-Ukrainian War (RUW). An online questionnaire assessed war-related variables (e.g., personal experiences with RUW, perceived concern and threat), previous life stress experiences, and mental health (i.e., resilience, anxiety, depression, perceived stress, ICD-11 PTSD, and CPTSD). Results showed regional differences. Ukrainians had the worst mental health indices, followed by participants in the bordering countries, and then by those in the distal ones. War-related variables were associated with worse mental health. The common predictors for PTSD and CPTSD were previous mental disorder, anxiety, and perceived stress, whereas

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unique predictors were also found (PTSD: female gender and impact of news on mental health; CPTSD: being single, overall impact of war on mental health, sum of lifetime traumatic experiences, resilience (inversely), and depression). Given the continuing uncertainty about the threat of war for many of the nations in this study, findings suggest the need for practitioners to support concerned populations.

1. Introduction

Three years after the outbreak of the COVID-19 pandemic, a large-scale invasion of Russia of Ukraine occurred on February 24, 2022 (Kalaitzaki and Tamiolaki, 2022). A growing body of evidence has indicated that, following the Russian-Ukrainian War (RUW), most Ukrainians experienced substantial deterioration of their mental health (e.g., increased stress, anxiety, and depression) (Hyland et al., 2023; Karatzias et al., 2023; Khan and Altalbe, 2023; Kurapov et al., 2023; Lushchak et al., 2024; Xu et al., 2023), which was already burdened due to the ongoing war since the Russian invasion of Eastern Ukraine in 2014 (e.g., Lushchak et al., 2024). One of the first studies found a high prevalence of anger (76.9 %), depression (84.3 %), nervousness (84.4 %), loneliness (51.8 %), and exhaustion (86.7 %) among Ukrainian university students and personnel (Kurapov, et al., 2023). Xu et al. (2023) and Chudzicka-Czupała et al. (2023) provided lower rates of psychological distress/stress (52.7 % and 28.6 %), anxiety (54.1 % and 46.3 %), depression (46.8 % and 46.5 %), insomnia (12.1 %) for Ukrainians, and Pavlova et al. (2022) reported similar rates for anxiety (44.4 %), depression (43.3 %), and insomnia (12.4 %) for Ukrainian civilian and professional combatants. The study by Lushchak et al. (2024) showed that moderate and extreme stress (64.4 % and 21.6 %) and anxiety (25.7 % and 23.4 %) were experienced by internally displaced persons followed by not displaced persons (moderate and severe stress: 68.2 % and 15.5 % and anxiety 25.6 % and 19.0 %). The Conservation of Resource theory (COR) (Hobfoll, 1989; Hobfoll et al., 2016) could offer a useful theoretical framework to explain war-related findings. COR suggests that actual or threatened loss of resources activates stress responses, and people invest interpersonal and/or intrapersonal resources (e.g., social support, resilience) to avoid further resource loss, reduce distress, and recover from loss.

Posttraumatic stress disorder (PTSD) is the most frequently studied trauma-related disorder in war-affected people (Morina et al., 2018). The ICD-11 PTSD diagnosis (World Health Organization, 2022) requires exposure to a traumatic event or a number of events and the presence of one symptom from each of the three clusters of reexperiencing the trauma in the here and now, avoidance of traumatic reminders, and a sense of current threat. A related diagnosis under the ICD-11 "disorders specifically associated with stress" group is the Complex post-traumatic stress disorder (CTSD). CPTSD diagnosis requires repeated, long-lasting trauma or a series of traumatic events and three additional symptom clusters to those of PTSD that reflect disturbances in self-organization (DSO) (i.e., affective dysregulation, negative self-concept, and disturbances in relationships).. Shevlin et al. (2018) have found that more than one-fifth of the internally displaced Ukrainians in 2016 already met diagnostic criteria for PTSD or CPTSD. A recent meta-analysis of war survivors from 1989 to 2019 globally found a 26.5 % PTSD prevalence (Hoppen et al., 2021), which is considerably higher than that of around 10 % or less in war-unaffected populations (Kessler et al., 2017).

Strangely enough, nearly three years after the RUW (time of writing of this paper), there is a dearth of research on the prevalence of ICD-11 PTSD and CPTSD in war-affected Ukrainians not to mention in people residing in distal countries (i.e., not sharing boarders with Ukraine). Before the RUW, rates of PTSD or CPTSD were already reported as high among internally displaced Ukrainians (more than one-fifth; Shevlin et al., 2018) or war survivors worldwide (26.5 % for PTSD; Hoppen et al., 2021), which are considerably higher than that of around 10 % or less in war-unaffected populations (Kessler et al., 2017). Soon after the RUW, the PTSD prevalence rate among Ukrainian university students

was 27 % (Rogowska and Pavlova, 2023), whereas among civilians ranged from extremely high (PTSD and moral injury 76 %) (Zasiekina et al., 2023) to low (mean PTSD 10.95 and mean CPTSD 22.6) (Kurapov et al., 2023). Lushchak et al. (2024) found very high rates of PTSD diagnosis among refugees (62.2 %), internally displaced persons (55.4 %), and non-displaced persons (50.8 %). Based on these findings, and others indicating that CPTSD is considered more likely to occur after continuous, severe, and intense traumatic stress exposure (Hyland et al., 2021; Kira et al., 2022; Kvedaraite et al., 2022), it is potentially reasonable to assume that nearly three years afterthe RUW, Ukrainians will presently be experiencing high rates of either PTSD or CPTSD.

Importantly, broader groups of people who are neither directly nor actively engaged in RUW nor are near the conflict zones, but rather are watching from afar could be emotionally involved and could also experience war-related mental health repercussions (Cricenti et al., 2022; Riad et al., 2022; Vintilă et al., 2023). Shared borders or geographic proximity to the conflict, hosting innumerable refugees, worries, uncertainty, and fear of spreading the war are a few factors that could take a toll on people's mental health primarily in neighboring countries (Gottschick et al., 2023; Kaniasty et al., 2023). Economic consequences of the war and exposure to media (Su et al., 2023) could just as likely be detrimental for people worldwide. Soon after the invasion (March to April 2022), high levels of anxiety (77.7 %) were manifested by citizens and Ukrainian refugees in Poland (Surzykiewicz et al., 2022), moderate to high levels of anxiety and depression (34 % and 40.7 %, respectively) were reported by Czech university students (Riad et al., 2022), and severe anxiety was reported by Germans (9.73 %; Gottschick et al., 2023).For the same period, similarly high rates of stress, anxiety, depression, and PTSD were reported for Taiwanese (3.7 %, 14.9 %, 11.2 %, and 56.9 %, respectively), Poles (17.4, 36.5, 29, and 57.2 %, respectively) and Ukrainians (28.6, 46.3, 46.5, and 73.2 %, respectively) (Chudzicka-Czupała et al., 2023).So far, there is no other study that has provided PTSD or CPTSD rates in other countries after RUW nor has compared rates with Ukraine.

The risk factors commonly associated with RUW-related PTSD or CPTSD include female gender (Eshel et al., 2023; Kang et al., 2023; Rogowska and Pavlova 2023; Zasiekina et al., 2023), younger age (Zasiekina et al., 2023), direct or high exposure to war, sense of danger and fear of war (Eshel et al., 2023; Karatzias et al., 2023; Rogowska and Pavlova, 2023; Zasiekina et al., 2023), frequent exposure to media (Chudzicka-Czupała et al., 2023; Karatzias et al., 2023; Riad et al., 2022), anxiety, depression, stress, low well-being and resilience (Eshel et al., 2023; Kurapov, et al., 2023).

In light of the protracted RUW and based on the literature indicating that RUW may have an impact on residents in various neighboring or distal countries (i.e., not sharing boarders), this survey aimed to explore the impact that the RUW might have had on the mental health among residents of various countries at different geographic distances from Ukraine. The proportion of people who meet diagnostic criteria for ICD-11 PTSD and CPTSD was also examined. In addition, the association of war-related variables with the mental health indices was studied, particularly their contribution to the diagnosis of PTSD and CPTSD, while controlling for demographic and psychosocial variables. Based on findings showing that considerable rates of PTSD and CPTSD were suffered by Ukrainians soon after the beginning of the RUW, and also before that, it could be anticipated that the RUW may have presently led to higher rates of PTSD and CPTSD. To our knowledge, there are few studies investigating mental health, particularly PTSD and CPTSD, in countries besides Ukraine. Examining the prevalence rates of these two

disorders in as many countries as possible will be important in guiding psychosocial interventions that would potentially need to be tailored to each disorder.

2. Methods

2.1. Design and procedure

This cross-sectional online survey was conducted in conformity with the Declaration of Helsinki requirements and approved by the Ethics Committee of the [omitted for blind review] and was released from July to October 2022. The same method and procedure were employed across all countries as explained in a detailed description provided to all partners before consenting to participate in the study and confirmed after the data collection. A Google Forms questionnaire was publicized online through social media platforms (e.g., Facebook, Instagram), news portals, and webpages. Potential participants were in turn invited to recruit participants from their contacts and networks. After being informed about the study and their rights (e.g., voluntary and confidential participation, discontinuation at their discretion) on the first page of the questionnaire, the informed consent form that followed was obligatory for participants to continue completing the survey.

2.2. Participants

Initially, the total sample of this study was 5604 adult community residents of 11 countries at different levels of proximity to the RUW, ranging from those bordering Ukraine (Romania and Poland) to distal ones (e.g., either close to Ukraine such as Greece and Italy or even in different continents, such as Ecuador and Peru). The same inclusion criteria were applied across all countries (i.e., men and women over 18 years old, able to read and write in their mother tongue, and having signed the informed consent of the study). No exclusion criteria were applied except for being <18 years old and not consenting to participate in the study. No incentives were offered to the potential participants. After controlling for outliers (anomaly index value greater than 2), 44 cases were excluded (International Business Machines Corporation 2021). The final sample of 5560 participants included participants from Ukraine ($N = 686$), Romania ($N = 845$), Poland ($N = 235$), Greece ($N = 391$), Italy ($N = 725$), Kazakhstan ($N = 159$), Oman ($N = 437$), Taiwan ($N = 299$), Ecuador ($N = 522$), Peru ($N = 787$), and Chile ($N = 474$). The detailed sociodemographic characteristics of the participants per country can be found in Appendix 1.

2.3. Instruments

Aligning with the International Test Commission's guidelines (2017), the instruments for which there was not a valid translation in the language of any country were translated into the target language. The online questionnaire included participants' demographic characteristics and the following:

2.3.1. War-related variables

Participants' personal experiences with RUW were assessed with two questions: the frequency (Not at all/Rarely; 1–2 h per week; 3–5 h per week; 6–7 h per week; >7 h per week) and source of information related to RUW (e.g., TV, internet). For participants from Ukraine, this section was omitted. *The impact of RUW on mental health* was assessed with three questions responded to on a five-point scale (1=not at all to 5=very much): impact of news on mental health, impact of economic crisis, and overall impact of war on mental health. *The perceived concern and threat* were assessed with three questions responded to on a five-point scale (1=not at all to 5=very much): concern about the likelihood of their country being involved in a war, stress about the idea that their country would be involved in a war, and concern about the war-related economic crisis.

2.3.2. Previous life stress experiences

The 17-item *Life Event Checklist for DSM-5* (LEC-5; Weathers et al., 2013) measured potentially stressful or traumatic lifetime events (e.g., assault, war) using six response options (happened to me, witnessed it, learned about it, part of my job, not sure, or doesn't apply). Its validity has been demonstrated by Gray et al. (2004). Cronbach's alpha in this study was 0.86.

2.3.3. Mental health

The Patient Health Questionnaire-4 (PHQ-4; Kroenke et al., 2009) assessed how bothersome symptoms of general anxiety and depression (two items each) were over the past 2 weeks on a four-point scale (0=not at all to 3=nearly every day). The PHQ-4 and its subscales have been proven valid and reliable in the adult general population (Kroenke et al., 2020) and Greeks in particular (Christodoulaki et al., 2022). Cronbach's alpha in this study was 0.88. The four-item *Perceived Stress Scale-4* (PSS-4) (Warttig et al., 2013) assessed the frequency of stressful experiences over the past month on a five-point scale (0=never to 4=very often). The PSS-4 has been proven valid and reliable across various European samples (Vallejo et al., 2018). Cronbach's alpha in this study was 63. The six-item *Brief Resilience Scale* (BRS) (Smith et al., 2008) measured the ability to bounce back or recover from stress on a five-point scale (1 = I strongly disagree to 5 = I strongly agree). Its validity and reliability have been demonstrated by Smith et al. (2023). Cronbach's alpha in this study was 0.75. Additionally, three items (responded Yes/No/Don't want to answer), assessed participants perceived physical and mental health and medication intake. *The International Trauma Questionnaire* (ITQ) (Cloitre et al., 2018) was used for ICD-11 PTSD and CPTSD diagnosis in response to RUW. The participants were instructed to indicate on a five-point scale (0=not at all to 4=extremely) the degree to which the most distressing war-related event was bothersome during the past month in 18 overall items, six of which assessed the three clusters of PTSD [i.e., re-experiencing (*Re*), avoidance (*Av*), and sense of threat (*Th*)], another six items assessed the three clusters of Disturbance in Self-Organization (DSO) [i.e., affective dysregulation (AD), negative self-concept (NSC), and disturbed relationships (DR)], and the final six items assessed functional impairment in social, occupational, and other areas of life, three for each cluster (PTSD and DSO). The ICD-11 diagnosis of PTSD requires trauma exposure, a score ≥ 2 in at least one of the two symptoms from each of the three clusters (i.e., *Re*, Ac, Ans Th), and a score ≥ 2 in at least one of the three areas of functional impairment. The diagnosis of CPTSD requires both the PTSD and DSO criteria to be met; DSO diagnosis is made if a score ≥ 2 in at least one of the two symptoms from each of the three DSO clusters (i.e., AD, NSC, and DR), and a score ≥ 2 in at least one of the three areas of functional impairment. According to ICD-11 either PTSD or CPTSD can be diagnosed and not both (World Health Organization, 2022). Evidence of validity for the ITQ has been demonstrated by numerous studies (see review by Redican et al., 2021). Cronbach's alpha in this study was 0.94.

2.4. Statistical analyses

Descriptive statistics presented the characteristics of the samples and the war impacts and concerns. To examine whether participants from different countries interpret the same instruments conceptually similarly, the measurement invariance (configural, metric, and scalar) of the study instruments was tested using multi-group confirmatory factor analyses (MGCFA). Three fit indices were used to consider configural invariance (CFI>0.95, RMSEA<0.06, and SRMR<0.08; Hu and Bentler, 1999). The nested models were compared mainly using the differences in CFI values (ΔCFI<0.01; Δ ± 0.01) and RMSEA (ΔRMSEA<0.015) (Cheung and Rensvold, 2002).

Pearson correlation coefficient was used to calculate the correlation of war-related variables with the mental health variables. A multivariate analysis of covariance (MANCOVA) was performed to explore the

impact that the geographical distance from the epicentre of RUW (1=Ukraine, 2=Bordering countries, and 3=Distal countries) may have had on mental health-related variables (i.e., resilience, perceived stress, anxiety, depression, LEC, PTSD, and CPTSD), after controlling for sex (0=Female, 1=Male) and age ($p<.007$, after Bonferroni correction). A chi-square test (x^2) was performed to explore the impact that the geographical distance may have had on the rate of people diagnosed with PTSD and CPTSD. Finally, two hierarchical logistic regressions (Wald method) were performed to examine the relationship between demographic factors, war-related, and mental health-related variables to the diagnostic categories of PTSD and CPTSD. In each regression, demographic variables were entered in the first step (i.e., gender, age, marital status, number of children, financial problems, having a chronic disease, having a mental illness, being a health professional, being under psychiatric medication), war-related variables were entered into the second step (e.g., the impact of the economic crisis, overall impact of war on mental health, perceived concern of the likelihood of a war, perceived stress consequences), and mental health variables were entered into the third step (sum of lifetime traumatic experiences, resilience, anxiety, depression, and perceived stress).

3. Results

3.1. Sociodemographics

Participants were mostly females (3120; 56.1 %), except in Ukraine and Peru. They had an average age ranging from 22.0 (Peru) to 37.4 (Chile) with a mean age of 28.4 years, (SD=11.1). The majority had higher education (2399; 43.1 %), with slight differences between the countries. Theyand were mostly singles (3303; 59.5 %), except for Ukraine, Poland, and Italy, where married people represented the highest percentage. Participants were also mostly students (2322; 41.9 %), whereas freelancer/self-employed individuals constituted the highest percentage in Ukraine and Greece, and private employees were the highest percentage in Taiwan and Chile. More demographics can be seen in Appendix 1.

3.2. The psychological and economic impact of RUW and perceived threat

Detailed results reporting on participants' concerns and war impacts can be seen in Appendix 2. Poles were moderate to very frequently informed about the war (27.7 %), followed by Italians (22.1 %). Internet was the predominant source of information with rates ranging from 43.0 % (Romanians) to 80.9 % (Kazakhs). Greeks, Italians, and Poles reported

concern about the RUW-related economic crisis (65 %, 73.8 %, and 51.5 %, respectively), and significant ('enough/very much') mental health impact because of RUW-related news (23 %, 19.8 %, and 15.8 %, respectively) and economic crisis (42 %, 40.4 %, and 21.7, respectively). Taiwanese people reported being 'enough/very much' concerned about the likelihood that their country will be involved in a war sooner or later (33.4 %), followed by Greeks (27.3 %), Kazakhs (26.4 %), and Poles (21.3 %). Stress about the perceived concern was reported by Greeks (53.2 %), Italians (43 %), and Poles (40 %).

The Mental Health Profiles of Participants per Geographical Distance Based on the ΔCFIs, the configural, metric, and scalar invariance across countries was supported for PHQ-4, the scalar invariance for BRS, the metric invariance for ITQ, and only configural invariance for and PSS-4 (Table 1). Scalar invariance for ITQ failed to be shown as ΔCFI (0.015) was slightly above the threshold.

In the whole sample, an average percent of 9.9 % for PTSD diagnosis (ranging from 4.0 % for Taiwanese to 15.2 % for Italians) and 10.2 % for CPTSD diagnosis (ranging from 5.1 % for Peruvians to 20.0 % for Poles) was observed. The MANCOVA results are presented in Table 2. There was a statistically significant difference between the three groups (Ukraine, bordering countries, distal countries) on the dependent variables after controlling for sex and age (F(14, 10,928) = 202.954, $p <$ .0001, Wilks' λ = 0.630, partial η^2 = 0.206, power=1.000). Significant univariate effects were found for all dependent variables, with Ukrainians being the less resilient respondents, experiencing more perceived stress, anxiety and depression, stressful life events, and the highest PTSD and DSO scores compared to the respondents in the bordering and distal countries. Ukraine and bordering countries had significantly more people diagnosed with CPTSD (12.5 % and 13.4 %, respectively) than those in the distal countries (8.9 %) (x2=23.189, df=2, $p<$.001), whereas no statistical differences were found for the CPTSD (x2=3.946, df=2, p=.139) (Table 2).

3.3. Correlation of RUW-related variables and mental health variables

Positive correlations were found between mental health variables and nearly all RUW-related variables, except resilience, which was negatively correlated with all RUW-related variables except 'frequency of information'. Unexpectedly, the 'frequency of information' did not significantly correlate with perceived stress (Appendix 3).

Table 1
Measurement invariance across countries for the study instruments.

Tested Model	X²	df	CFI	RMSEA (90 %CI)	SRMR	Δχ2 (Δdf)	ΔCFI	ΔRMSEA	ΔSRMR	Model comp	Decision
ITQ											
M1: Configural	863.34***	188	.982	.051 (0.048–0.055)	.034	–	–	—	–	–	–
M2: Metric	1050.55***	218	.978	.053 (0.050–0.056)	.044	187.21(30)	.004	.003	.010	M1	Accept
M3: Scalar	1629.50***	230	.963	.067 (0.064–0.070)	.049	578.95(12)	.015	.014	.005	M2	Reject
BRS											
M1: Configural	98.563***	20	.992	.053 (0.043–0.064)	.014	–	–	—	–	–	–
M2: Metric	615.53***	35	.943	.110 (0.102–0.117)	.092	516.96(15)	.049	.057	.078	M1	Reject
M3: Scalar	4530.50***	66	.564	.221 (0.216–0.227)	.160	836.54(15)	.081	.006	.015	M2	Accept
PSS-4											
M1: Configural	2.955	4	1.000	.000 (0.000–0.035)	.003	–	–	—	–	–	–
M2: Metric	141.63***	13	.978	.085 (0.072–0.097)	.062	138.67(9)	.022	.085	.059	M1	Reject
M3: Scalar	335.00***	22	.947	.101 (0.092–0.111)	.077	193.37(9)	.031	**.016**	.015	M2	Reject
PHQ-4											
M1: Configural	9.068***	0	.999	.000 (0.000–0.000)	.003	–	–	—	–	–	–
M2: Metric	37.094***	9	.998	.047 (0.032–0.064)	.016	28.026(9)	.001	.047	.013	M1	Accept
M3: Scalar	110.20***	4	.991	.138 (0.117–0.161)	.045	73.106(5)	.007	.091	.029	M2	Accept

Notes: χ2 = χ2 test, df = degrees of freedom, RMSEA = root-mean-square error of approximation, CFI = comparative fit index, SRMR = standardized root mean squared residual, Model comp = model comparison, Δχ2 = χ2 difference test, Δdf = difference in degree of freedom, ΔRMSEA = root-mean-square error of approximation difference, ΔCFI = comparative fit index difference, *$p < .05$; **$p < .01$;; ***$p < .001$.

Table 2
The psychosocial profiles of participants per geographical distance from Ukraine.

	Ukraine M (CI)/%	Bordering countries M (CI)/%	Distal countries M (CI)/%	F/x2 (p)	Partial η^2	Observed power
Resilience	2.77 (2.71 to 2.83)	3.27 (3.23 to 3.32) *	3.17 (3.15 to 3.19) *	90.99 (<0.001)	.032	1.000
Perceived Stress	7.92 (7.69 to 8.15)	6.58 (6.41 to 6.76) *	6.92 (6.82 to 7.01) *	40.93 (<0.001)	.015	1.000
PHQ Anxiety	1.29 (1.22 to 1.36)	1.08 (1.03 to 1.14) *	0.95 (0.92 to 0.98) *	47.80 (<0.001)	.017	1.000
PHQ Depression	1.38 (1.31 to 1.45)	1.03 (0.98 to 1.08) *	0.88 (0.85 to 0.90) *	98.01 (<0.001)	.035	1.000
LEC	9.28 (9.05 to 9.51)	2.72 (2.54 to 2.90) *	2.68 (2.58 to 2.77) *	1383.28 (<0.001)	.336	1.000
PTSD score	9.55 (9.10 to 9.99)	8.55 (8.21 to 8.90) [*,n.s.]	7.19 (7.01 to 7.37) [*, n.s.]	61.75 (<0.001)	.022	1.000
DSO score	9.79 (9.349 to 10.24)	8.10 (7.75 to 8.45) *	6.71 (6.52 to 6.89) *	91.17 (<0.001)	.032	1.000
PTSD diagnosis	11.5 %	10.6 %	9.4 %	3.946 (n.s.)		
CPTSD diagnosis	12.5 %	13.4 %	8.9 %	23.189 (<0.000)		

Note. Bordering countries: Romania & Poland; Distal countries: Greece, Italy, Kazakhstan, Oman, Taiwan, Ecuador, Peru, Chile; M: mean; CI: Confidence Interval; % and x2 are presented only for PTSD and CPTSD diagnoses; PHQ Anxiety: Anxiety scale of the Patient Health Questionnaire-4; PHQ Depression: Depression scale of the Patient Health Questionnaire-4; LEC: Life Event Checklist for DSM-5; PTSD: Post-traumatic stress disorder; DSO: Disturbance in Self-Organization * statistically significant pairwise comparisons of the Bordering and Distal countries from Ukraine and between the Bordering and Distal countries; n.s.: non-significant pairwise comparisons between the Bordering and Distal countries.

3.4. Prediction of PTSD and CPTSD by war-related and mental health-related variables

Different models for PTSD and CPTSD were revealed, explaining 28 % and 32.7 % (Nagelkerke R Square) of the variance with five and nine predictors, respectively (Table 3). The PTSD diagnosis was predicted ($\chi^2(7) = 157.31$, $p < .001$) by *gender* (inversely), with women presenting significantly higher levels of PTSD, *presence of a mental disorder,*

Table 3
Hierarchical binary logistic regression analyses for the prediction of diagnostic categories of PTSD and CPTSD (Method: Wald) by demographic. war-related and mental health-related variables.

PTSD	B	S.E.	Wald	Exp (B)
Gender	−0.38**	0.13	7.93	0.69
Past psychiatric history	0.45**	0.15	8.83	1.56
Impact of news on mental health	0.28***	0.06	20.64	1.32
Perceived concern about the likelihood of a war	0.11ns	0.06	3.53	1.11
Perceived concern about the economic crisis	0.07 ns	0.06	1.56	1.08
PHQ Anxiety	0.42***	0.08	28.8	1.52
Perceived Stress	−0.05*	0.02	4.33	0.95
Cox & Snell R2 = 0.04. Nagelkerke R2 = 0.09. Omnibus χ2 = 157.31***				

CPTSD	B	S.E.	Wald	Exp (B)
Gender	0.14ns	0.15	0.94	1.15
Age	−0.00ns	0.01	0.06	1.00
Degree of financial problems	0.05ns	0.06	0.76	1.06
Marital status (single)	0.46**	0.16	8.65	1.58
Chronic disease	−0.00ns	0.18	0.00	1.00
Health professional	−0.38ns	0.23	2.77	0.69
Past psychiatric history	0.48**	0.16	8.98	1.62
Perceived concern about the likelihood of a war	0.08ns	0.06	1.51	1.08
Overall impact of war on mental health	0.14***	0.04	9.78	1.15
Proximity (bordering countries)	0.32*	0.15	4.75	1.38
LEC (Sum of Lifetime Traumatic Experiences)	0.12***	0.02	26.01	1.13
Resilience	−0.05***	0.02	10.41	0.95
PHQ Anxiety	0.26**	0.10	6.73	1.30
PHQ Depression	0.64***	0.10	41.52	1.90
PSS Perceived Stress	0.16***	0.03	28.42	1.17
Cox & Snell R^2 = 0.16. Nagelkerke R^2 = 0.35. Omnibus χ^2 = 707.24***				

Note: PTSD: Post-traumatic stress disorder; CPTSD: Complex Post-traumatic stress disorder; LEC: Life Event Checklist for DSM-5; PHQ Anxiety: Anxiety scale of the Patient Health Questionnaire-4; PHQ Depression: Depression scale of the Patient Health Questionnaire-4; PSS: Perceived Stress Scale, * $p < .05$. ** $p < .01$. *** $p < .001$. [ns]: not statistically significant.

impact of news on mental health, anxiety, and *perceived stress* (inversely). The CPTSD diagnosis was predicted ($\chi^2(15) = 707.24$, $p < .001$) by the mari*tal status* of being single, the *presence of a mental disorder,* the *overall impact of war on mental health,* the *proximity to Ukraine,* with the bordering countries having a higher chance, the sum of the *lifetime traumatic experiences, resilience* (inversely), *anxiety, depression,* and *perceived stress.*

4. Discussion

In this study, differences in the war-related and mental health-related variables were observed among the 11 countries worldwide in terms of the geographic proximity to Ukraine. As expected, people from countries near Ukraine were more frequently informed about RUW, experienced greater concerns and stress about the likelihood of a war, and greater mental health impacts because of the war news and economic crisis compared to those located far away from the conflict zone. The Taiwanese particularly, followed by the Greeks, expressed the highest concerns about the likelihood of a war, potentially because of the recent Taiwan-China tensions (Stošić, 2023) and the lifelong history of Greek-Turkish military conflicts and the recent escalating political tensions (Grigoriadis, 2022). It is noteworthy that participants from distal countries did share concerns about the war-related economic crisis, in line with findings demonstrating the economic consequences of RUW globally (Seleznova et al., 2023).

In agreement with accumulating evidence of worse mental health following RUW (Hyland et al., 2023; Karatzias et al., 2023; Khan and Altalbe, 2023; Limaj et al., 2023), Ukrainians unequivocally reported worse levels of all mental health indices compared to bordering and distal countries. Although the rate of Ukrainians screened positive for CPTSD has largely ranged across studies (Hyland et al., 2024; Karatzias et al., 2023; Lotzin et al., 2023; McGinty et al., 2023; Wang et al., 2024), in this study, it was higher for Ukrainians and bordering countries than the distal countries. Ukrainians also had the lowest resilience levels, though at comparable levels to similar studies (Kurapov, Kalaitzaki, et al., 2023). The association of low resilience with high levels of mental health symptoms has also been found in other traumatic/stressful contexts (Munk et al., 2020). Other explanations, such as the accumulative and/or overlapping mental health effects of other factors (e.g., COVID-19) could also be possible and invite further research (Khan and Altalbe, 2023). According to the Conservation of resources (COR) theory (Hobfoll, 1989; Hobfoll et al., 2016), RUW is intertwined with resource losses which activate stress responses, the levels of which were reported very high for Ukrainians in this study. Despite the social support that Ukrainians receive during RUW (Palace et al., 2023; Velykodna et al., 2024), extreme resource loss and resultant overwhelming stress seem to have depleted resources (i.e., resilience) and thus Ukrainians cannot be sufficiently buffered against the adverse mental health effects. After all,

Hobfoll et al. (2003) have indicated that resource loss may have a greater negative mental health impact than resource gain.

Counties not directly involved in the war were also affected, in line with findings from studies conducted in Germany (Hajek et al., 2023) and Israel (Palgi et al., 2023). As expected (e.g., Chudzicka-Czupała et al., 2023; Piskunowicz et al., 2023), worse mental health was generally reported by people living in the bordering countries compared to those living in distal countries; Romanians and Poles' mental health (i.e., anxiety, depression, and DSO) was worse than that in the distal countries, and experienced significantly more stressful life events. Undeniably, the sudden influx of thousands of Ukrainians has put nearby countries, such as Poland, under severe stress (Karakiewicz-Krawczyk et al., 2022) and has potentially led to mental health deterioration (Surzykiewicz et al., 2022). The potential of a future war with Russia may also explain the findings since the RUW-related variables (e.g., the impact of news, concern, and threat of war) were associated with worse mental health in the overall sample, which is consistent with other study findings (Hajek et al., 2023; Mottola et al., 2023). These findings suggest that there is no need for one to be personally involved in the war to be psychologically affected; ongoing armed conflict in one's nearby country can be a significant stressor.

Consistent with the expectations (Eshel et al., 2023; Kalaitzaki et al., 2023; Kurapov, Kalaitzaki, et al., 2023; Velykodna et al., 2024) a number of variables (i.e., anxiety, perceived stress, and past psychiatric history) were common predictors of both PTSD and CPTSD in the overall sample. A pre-existing mental disorder may be discussed in relation to the ongoing conflict and displacement since 2014 (Bogic et al., 2015; Morina et al., 2018). Quite plausibly, it has been proposed that the interplay between environmental stressors (e.g., RUW) and individual vulnerabilities (e.g., psychiatric history) could predispose to the later development of more severe and sustained psychological symptoms (Kalaitzaki et al., 2023; Kurapov, Kalaitzaki, et al., 2023; Limaj et al., 2023). In line with relevant studies, unique predictors of PTSD were the female gender (Eshel et al., 2023), and the impact of war news (Chudzicka-Czupała et al., 2023; Karatzias et al., 2023; Riad et al., 2022; Xu et al., 2023). Unique predictors of CPTSD were depression and decreased resilience (Eshel et al., 2023; Kurapov, Kalaitzaki, et al., 2023), and reasonably enough, exposure to a greater number of lifetime traumatic experiences (Hyland et al., 2021) and borders with Ukraine (Kaniasty et al., 2023). Being single also contributed to increased CPTSD rates, which corroborates relevant findings (i.e., positive association with loneliness, Kazlauskas et al., 2022; and negative association with social support/living with a friend, Palace et al., 2023; Simon et al., 2019; Velykodna et al., 2024). These findings add to the scarce research related to PTSD and CPTSD predictors so far in the context of RUW.

A number of limitations should be considered. First, the findings should be cautiously interpreted since no scalar invariance was supported for all study measures. The samples, though big, were not homogenous and certainly not representative. Like other studies (Karatzias et al., 2023; Kurapov, Pavlenko, et al., 2023; Velykodna et al., 2024), the samples consisted of a higher proportion of females (except the Ukrainian one). The unequal number of participants and the uneven gender distribution between the samples should be mentioned. We did not know the participants' mental health status before RUW or whether they owned personal resources (e.g., resilience) that may have confounded their status presently. The biases of the self-report and online nature of the questionnaires should also be acknowledged. Particularly for diagnosing PTSD and CPTSD, self-report questionnaires could be an important methodological issue; self-perceived PTSD symptoms may not coincide with clinical diagnosis. Besides, asking participants to complete the ITQ having in mind the war in Ukraine does not necessarily ensure the validity of their responses. However, the many validation studies of ITQ that suggest that this is a valid and reliable measure of trauma-related symptoms somehow attenuates the importance of this assertion. The cross-sectional methodology does not allow for causal inferences. Participants in each country will need to be assessed in longitudinal studies to capture the present and future mental health responses to RUW, determine the trajectory through which these evolve, and predictors of PTSD and CPTSD in each country. Nearly three years after the beginning of the RUW, a puzzle that remains to be figured out is whether mental health issues in Ukraine and globally are abrupt and temporary responses to the RUW or longer-lasting and well-established mental health issues that could potentially lead to higher rates of PTSD or CPTSD in the months and years ahead (Kalaitzaki and Tamiolaki, 2022; Limaj et al., 2023). Examining PTSD and CPTSD rates after the cessation of this war would be of particular interest.

Nonetheless, the authors do hope that this study has provided useful insights into the mental health effects of RUW across countries with different geographical distances from the epicentre of the war. Specific predictors for PTSD and CPTSD were recognized, and assumptions can be made for each country based on the mental health indices of each. Particularly for Ukraine, low levels of psychological resilience may be worrying for their ability to withstand, thus calling for urgent and timely interventions. However, research needs to examine the relationship between low psychological resilience as a personal trait with the high community and societal resilience that has been found in Ukraine (Goodwin et al., 2023; Kimhi et al., 2023). Assuming that before RUW, Ukrainians already had high rates of PTSD or CPTSD similar to other war-affected populations (Shevlin et al., 2018), and considering that the current PTSD estimates (between 47.8 % and 51.33 %; Ressler et al., 2024) are higher than those in other war-affected populations (26.51 %; Hoppen et al., 2021), which might even have been underestimated during wartime (Chebotaryova et al., 2023), and given the present findings about the role of history of mental disorders in increasing the chances of PTSD and CPTSD, the worsening of Ukrainian's mental health could be a realistic foreseeable evolution. For this, financial and human resources must be invested in addressing their needs. Women and singles, particularly in Ukraine and bordering countries, are also at high risk. Tailored actions, taking into consideration the protective factors and those modifiable risk ones, should be urgently incorporated into routine care and a thorough healthcare policy after war needs to redesign services and develop specialized interventions to inhibit the spreading of the deleterious mental health ramifications of the RUW. Since geographically close and distal countries were also affected, extended and timely actions need to be made . The World Health Organization, and professional and humanitarian aid organizations at a global level, should undertake any actions to minimize the mental health costs of repeated traumatization. In summary, addressing the mental health needs of those at risk and concurrently strengthening their inner resources (i.e., resilience), should be an important target in supporting those in need. Hopefully, these findings will inform policymakers and guide interventions to address mental health issues for people at risk worldwide and make their mental health prevention and treatment a global priority.

Data Accessibility statement

Data will be available upon request.

CRediT authorship contribution statement

Argyroula Kalaitzaki: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Robin Goodwin:** Writing – review & editing, Methodology, Conceptualization. **Anton Kurapov:** Writing – review & editing, Methodology, Data curation. **Mona Vintila:** Writing – review & editing, Methodology, Data curation,

Conceptualization. **Gianina Lazarescu:** Formal analysis, Writing – review & editing. **Serhii Lytvyn:** Writing – review & editing, Writing – original draft, Data curation. **George Tsouvelas:** Writing – review & editing, Formal analysis, Data curation. **Alexandra Tamiolaki:** Writing – review & editing, Data curation. **Ivan Danyliuk:** Writing – review & editing, Data curation. **Jano Ramos-Diaz:** Writing – review & editing, Data curation. **Augusto Gnisci:** Writing – review & editing, Data curation. **Ida Sergi:** Writing – review & editing, Data curation. **Francesca Mottola:** Writing – review & editing, Data curation. **Larysa Stulnikova:** Writing – review & editing, Data curation. **Claudio Lopez-Calle:** Writing – review & editing, Data curation. **Gonzalo Salas:** Writing – review & editing, Data curation. **Mai Helmy:** Writing – review & editing, Data curation. **Yi-Lung Chen:** Writing – review & editing, Data curation. **Cheng-Fang Yen:** Writing – review & editing, Data curation. **Kamila Czepczor-Bernat:** Writing – review & editing, Data curation. **Adil Samekin:** Writing – review & editing, Data curation. **Gulmira Topanova:** Writing – review & editing, Data curation. **Viktor Nikolaevich Zhamuldinov:** Writing – review & editing, Data curation.

Declaration of competing interest

The authors have nothing to declare.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2024.116248.

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