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ORIGINAL PAPER

Post-traumatic Stress Disorder and Moral Injury Among Ukrainian Civilians During the Ongoing War

Larysa Zasiekina[1,2] · **Serhii Zasiekin**[1,3] · **Victor Kuperman**[4]

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Abstract

While severity of post-traumatic stress disorder (PTSD) symptoms and moral injury among civilians affected by armed conflicts is generally understudied, even less research exists on civilian populations during an active war. This paper reports a large-scale study that administered standard assessments of PTSD and moral injury severity, as well as rich demographic questionnaires, to nearly 1300 Ukrainian civilians during the ongoing Russian invasion. Analyses revealed an extremely high prevalence of severe PTSD symptoms and moral injury, relative to both proposed clinical cut-offs and to earlier measurements from a similar population. Further regression analyses identified risk factors and protective factors. Greater severity of PTSD symptoms was observed among women, older and forcibly displaced individuals, and individuals from geographic regions under Russian occupation. Higher education correlated with milder PTSD symptoms. Moral injury was particularly strong in younger individuals. The present study is one of the first to report a large scale set of psychological data collected from the civilian population of Ukraine during the ongoing Russian invasion. It is obvious from the scope and long-term nature of the atrocities that psychological treatment of the civilian population will be required both presently, while the hostilities are ongoing, and in the future. This data contributes to a detailed understanding of the psychological response to traumatic stress, including its overall prevalence and presence in specific demographically and geographically defined civilian groups.

Keywords PTSD · Moral injury · Risk and protective factors · War · Trauma

Introduction

In recent years, Ukrainians have experienced many traumatic events related to the Revolution of Dignity (2014), the annexation of Crimea (2014), the armed conflict in Eastern Ukraine (2014–2021), and, most recently, Russia's full-scale military invasion (2022), which is ongoing at the time of this writing. The political, social, and economic uncertainty in Ukraine, as well as the current long-term exposure to Russian warfare has turned Ukraine into a country under prolonged duress. As a result, many Ukrainian civilians live under continuous traumatic stress, a condition which often leads to post-traumatic stress disorder (PTSD) and moral injury [13, 14]. This study reports the prevalence of PTSD and moral injury symptoms among Ukrainian civilians during the active war and identifies protective and risk factors for both psychological responses to a potentially traumatizing experience. To our knowledge, this is one of the first empirical psychological studies of the civilian population conducted during the course of the hostilities.

While the phenomenology and diagnostics of PTSD are well-established, the concept of moral injury is relatively new and is defined as a strong cognitive and emotional response after events that violate a person's moral principles and beliefs [15, 36]. The meta-analytic results support reliable associations between moral injury and PTSD outcomes and poorer mental health in terms of higher rates of anxiety, depression, suicidality, and substance use [24, 35]. Yet moral injury and PTSD are dissociable: The existing body of research on military personnel highlights behavioral and attitudinal differences between moral injury and PTSD. Moral injury expresses itself in loss of trust towards others, feelings of self-worthlessness and self-blame, leading to behavioral patterns of seeking help and apologizing.

✉ Larysa Zasiekina
zasyekina.larisa@vnu.edu.ua

1 Lesya Ukrainka Volyn National University, Lutsk, Ukraine

2 University of Cambridge, Cambridge, UK

3 University College London, London, UK

4 McMaster University, Hamilton, ON, Canada

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Conversely, feelings of losing control and continuous threat lead to avoidance behaviors in PTSD [4, 11, 17]. Additionally, moral injury frequently manifests as emotions of shame and guilt, while PTSD is characterized mostly by emotions of anger, hatred, and outrage.

In contrast to research on military personnel, there is much less information about moral injury and PTSD in civilians, especially under the circumstances of present and ongoing atrocities. Yet, according to the World Health Organization, 10% of civilians who have experienced war have serious mental health problems and another 10% have problems with physical and social functioning [37]. Shevlin et al. [30] examined the prevalence of PTSD in a large sample of Ukrainians internally displaced after the annexation of Crimea and war in Eastern Ukraine. They reported an even higher prevalence of PTSD (27.4% using the DSM PCL-5 questionnaire, see below), especially for women (31.1% vs 19.6% for men). It is likely that, compared with the military personnel, civilians have less psychological preparedness and fewer coping resources on which to draw during war atrocity. For instance, Bryant, Schnurr, & Pedlar [7] argue that one protective factor for military-serving personnel is a sense of unit cohesion, which civilians do not have.

Demonstrably, the individual's personal and coping resources are of crucial importance and are predictors of one's psychological responses to trauma (e.g., [29]). For instance, younger age, higher level of trauma, lack of religious affiliation, and lower religiosity are correlated with increased severity of moral injury symptoms among civilian healthcare staff and service users from general medical clinics [13, 23] (see also Sareen [29] for a review of PTSD risk factors). However, protective and risk factors for moral injury and PTSD among civilians during wartime are virtually unstudied. This paper's first aim is to fill the gap in the existing body of knowledge about the prevalence of PTSD and moral injury symptoms among the civilian population during active and long-term hostilities. We addressed this aim by collecting and analyzing questionnaires tapping into PTSD and moral injury symptoms from close to 1300 Ukrainian civilians during the ongoing armed conflict. The second aim of the study is to identify protective and risk factors with respect to symptoms of PTSD and moral injury. We cast a wide net and looked at both demographic and personal characteristics of civilians as well as individual and nationwide war-related circumstances. Understanding how moral injury and PTSD and their associated mental health symptoms manifest in civilians could lead to developing more effective and targeted intervention programmes.

In summary, we pursued the following set of research questions:

RQ1 What is the prevalence of PTSD and moral injury in the Ukrainian civilian population under hostilities? This question was examined through a comparison of the novel psychological data against diagnostic cut-offs proposed for each test and against a highly similar population tested by Shevlin et al. [30] prior to the Russia-Ukraine war.

RQ2 What are the protective and risk factors for symptoms of PTSD and moral injury? We examine this question by fitting regression models to the respective test scores with a wide range of predictors reflecting both the individual characteristics of the respondent and their degree of engagement in the war events.

Methods

This study is part of the Narratives of War collaborative project, initiated by the Ukrainian Psychotrauma Center (UPC) at Lesya Ukrainka Volyn National University (Ukraine) and the Centre for Advanced Research in Experimental and Applied Linguistics at McMaster University (Canada). The study was reviewed and approved by the Research Ethics Committee (#03-24/04/1070) at Lesya Ukrainka Volyn National University and the Research Ethics Board of McMaster University (#6045).

Participants

As of 03 March 2023, a total of 1499 participants contributed to the Narratives of War project. All of them completed a narrative writing task and 1,267 of them also submitted demographic and psychological questionnaire data, see descriptions of tasks below. The respondents ranged in age from 12 to 77 years. We removed one participant with an invalid age value and 36 participants younger than 18 years old. Analyses below are based on the resulting pool of 1249 participants who completed all tasks. Table 1 summarizes descriptive statistics of the demographic and questionnaire data.

Procedure

This online study was administered in May 2022–January 2023. Participants were recruited by the UPC via its website and Facebook page and were provided with an information sheet and a consent form. They communicated their consent by filling the respective field in the online Google form. Upon consent, participants were invited to fill in their demographic data and questionnaires through Google forms. They were also asked to complete the narrative writing task, i.e., describe their experience of the Russia-Ukraine war in at

Table 1 Descriptive statistics of dependent variables and predictors in the study

Predictor	Levels	N	Min, Median, Mean (SD), Max
Gender	Female	1032	
	Male	216	
	Other	1	
Age		1249	18, 32, 34 (11), 77
Education	Secondary	222	
	College	363	
	Bachelor	187	
	Master, Specialist, PhD	477	
Marital status	Married	641	
	Not married (single, divorced, widowed)	608	
Displaced	No	682	
	Yes	567	
Occupation status*	Occupied	735	
	Deoccupied	186	
	Never occupied	328	
Region	Central	198	
	Eastern	267	
	Northern	172	
	Southern	485	
	Western	127	
Dependent variable			
PCL-5 score		1249	0, 46, 44.6 (16.64), 80
MISS score		1249	10, 42, 42.41 (13.15), 92

N = 1249

*Occupation status is determined per oblast at the date of response submission

least 200 words. Participants were paid UAH200 as a compensation for their time.

Materials and Variables

Two psychological questionnaires were used in the study. One is the standard PTSD Checklist for DSM-5 [33], labeled here as PCL-5. The questionnaire consists of 20 Likert-scale questions asking how much the respondent has been bothered by a given problem in the past month, from 0 ("not at all") to 4 ("extremely"). The PCL-5 total scores range from 0 to 80, with a higher score corresponding to a higher total severity of PTSD symptoms. The original English version of the test showed good internal consistency and test-reliability in US veterans ($\alpha = 0.96$ and $r = 0.84$) [5], and trauma-exposed civil populations ($\alpha = 0.94$ and $r = 0.82$) [3]. Importantly, the Ukrainian version of the PCL-5 questionnaire conducted on a large sample (N = 2203) of internally displaced Ukrainians in 2016 showed a very high reliability of the total scale ($\alpha = 0.96$) and subscales [30]. The cut-off PCL-5 score for detecting possible PTSD is estimated to be in the 31–33 point range for veterans [5], 33 for police officers [32], and 41 for first responders [25].

The second questionnaire is the Military Version Short Form of the Moral Injury Symptom Scale [21], labeled here as MISS. This Likert scale consists of 10 statements (e.g., "I feel betrayed by leaders who I once trusted") with response options ranging from 0 ("strongly disagree") to 10 ("strongly agree"). The total score occupies a range from 10 to 100, with higher values corresponding to the higher level of moral injury. The Ukrainian version of MISS-M-SF scale demonstrates sound psychometric properties [38] and was adopted to assess moral injury in military and civilian populations according to the procedure suggested by Fani et al. [13]. Reliability was assessed through internal consistency using Cronbach's $\alpha = 0.70$ (n = 111), and the test–retest reliability in 8 days, $r = 0.67$, $p < 0.01$ (n = 32). Zasiekina and Kozihora assess discriminant validity of MISS-M-SF through association with PCL-5, which is $r = 0.36$ and MISS-M-SF through association with the Generalized Anxiety Disorder 7-item scale, which is $r = 0.37$, both $ps \leq 0.05$. Convergent validity is expressed by the correlation of MISS-M-SF and other measures of emotional distress, namely the Patient

Health Questionnaire ($r = 0.53$ $p < 0.01$). Mantri et al. [22] proposes the score of 36 as a diagnostic cut-off for health care professionals.

Dependent Variables

PCL-5 and MISS test scores were dependent variables in this study.

Independent Variables

Since our interest is in protective and risk factors among civilians experiencing a prolonged traumatic stress, we considered multiple geographic and demographic factors as independent variables of potential influence. These included gender (with male, female and other as options), age, marital status (married or not married), and education (with secondary, college/vocational secondary, bachelor's degree, and higher university degree as levels). To link participants to various circumstances of the ongoing war, we identified the respondent's reported pre-war place of residence against five major geographical regions of Ukraine. We further identified the occupation status of the specific administrative unit (oblast) at the time of the respondent's study completion (Occupied by the Russian troops, De-occupied, Never occupied). Finally, we asked whether a respondent was displaced (internal displacement or emigration) at the time of responding. See Table 1 for descriptive statistics of each variable.

Statistical Considerations

Due to the unpredictable duration and scope of the ongoing warfare, we did not plan for a specific sample size and were rather guided by resource limitations and availability of respondents. The post-hoc power calculation for the two inferential tests used here—a one-sample t-test and linear regression—is as follows. With N = 1249 and the nominal significance level of 5%, the present sample enables accurate detection of a very small effect ($d = 0.08$) in a one-sample t-test with the conventional 80% statistical power: a common effect size in psychological experiments is 5 times bigger ($d = 0.4$) [8]. Similarly, under the same assumptions, this sample enables detection of a very small effect in a linear regression model ($f2 = 0.01$): This effect size is 20 times smaller than what is considered a small effect by Cohen [10]. We conclude that this study is properly powered.

All analyses in this paper were conducted using the statistical platform R v 4.2.2 [28]. Power analyses were done using the package *pwr* [9]. Plots were made using the package *ggplot2* [34]. Also used were the package *effects* [16] and the function *lm* from the basic distribution *stats* package. For categorical predictors, we report effects both in the original test scale and standardized, in units of standard deviation.

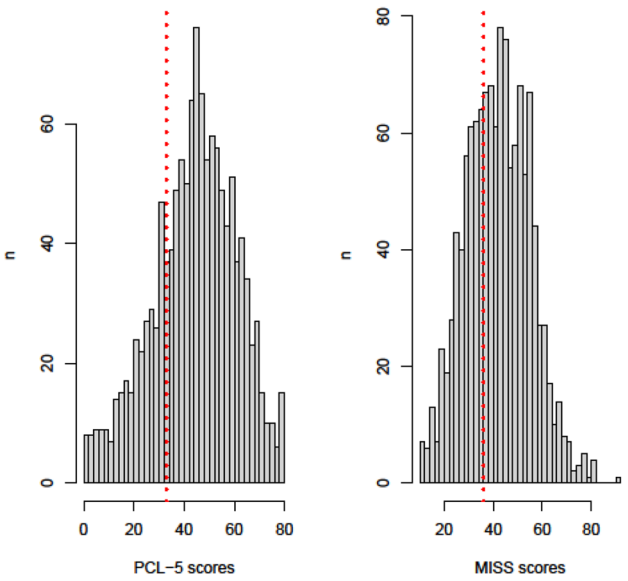


Fig. 1 Distributions of PTSD Checklist for DSM-5 (PCL-5) (left) and Moral Injury Symptom Scale (MISS) (right) scores. Red dotted lines indicate proposed diagnostic cut-offs

Results and Discussion

Figure 1 visualizes distributions of PCL-5 and MISS scores in the present sample of N = 1249 respondents. Reliability of the PCL-5 scores in the sample of Ukrainian civilians was very high (ICC(2,*k*) = 0.92, 95% CI [0.91, 0.92]) in line with Shevlin et al. [30]. However, reliability of the MISS scores was only moderate (ICC(2,*k*) = 0.53, 95% CI [0.47, 0.59]). Scores of the two tests show a positive and significant correlation ($r = 0.33$ 95% CI [0.28–0.39], $p < 0.001$). This correlation is moderate in size (using Cohen's [10] criteria), which both reflects the threshold of internal reliability and supports the notion that the questionnaires tapped into substantially different facets of the psychological experience of trauma.

Prevalence of PTSD and MISS in the Sample

Our RQ1 concerns estimation of the prevalence of PTSD and moral injury among Ukrainian civilians during the ongoing war. Figure 1 visualizes diagnostic cut-offs proposed in the respective literatures (the PCL-5 score of 33 and the MISS score of 36), see the Materials section above. The percentage of respondents *exceeding* the cut-offs was 76% for PCL-5 and 66% for MISS. The difference between

the mean score of the sample and the diagnostic cut-off was highly significant for both tests (PCL-5: $t(1248) = 24.70$, $p < 0.001$; MISS: $t(1248) = 17.24$, $p < 0.001$). These numbers indicate an astounding prevalence of diagnostically relevant PTSD symptoms and moral injury.

Another relevant comparison is of the present data with Shevlin et al.'s [30] analysis of the PTSD symptoms among Ukrainians internally displaced after the annexation of Crimea and war in Eastern Ukraine in 2014. Shevlin et al.'s study targeted the same population and administered the same PCL-5 questionnaire, as in the present study. In line with Bovin et al. [5], Shevlin et al. applied the following diagnostic criteria for probable PTSD symptoms: a score of at least 2 (moderately) for "at least one intrusion symptom, one avoidance symptom, two NACM [negative alterations in cognition and mood] symptoms and two arousal symptoms". Additionally, to meet the criteria of probable PTSD symptoms, these symptoms were to be present for at least one month and associated with at least one functional impairment (as determined by Shevlin et al. using the ICD-11 test). The prevalence of DSM-5 PTSD reported among internally displaced Ukrainians in 2016 was 27.4%. We used the same PCL-5 criteria as in Shevlin et al. but were not able to apply the additional criteria based on the ICD-11 test. The percentage of respondents meeting these criteria in the present-day sample of Ukrainians was 74.4%. While this estimate would likely be reduced if we applied additional criteria, there is no doubt that the prevalence of PTSD symptoms is much higher among the civilians currently experiencing war than among a highly similar population tested in 2016, some two years after their experience of traumatic events.

Protective and Risk Factors

To identify significant predictors of both PCL-5 and MISS scores, we fitted a linear regression model to each dependent variable. Initially, both models included the following predictors: age, gender, region, occupation status, displacement status, marital status, and education level, as well as a three-way interaction between age, gender, and region, a two-way interaction between gender and marital status, and a two-way interaction between region and displacement status. Visual inspection of trends in the data revealed substantial non-linearity in the effect of age on both PCL-5 and MISS scores. To reflect the non-linear effect in the fitted model, we modeled it as a quadratic polynomial. Finally, the backward stepwise elimination procedure (using the function stepAIC in the library MASS) removed predictors that did not significantly contribute to either model's goodness of fit, gauged as the model's Aikaike's criterion (AIC). Figure 2 visualizes partial effects of all predictors that reached statistical significance (at the 5% level) in the respective regression models.

The regression model fitted to PCL-5 scores revealed several factors of influence, significant at the 5% level, see Table 2.

First, female respondents showed significantly higher total severity of PTSD symptoms ($46.48 \pm SE\ 0.61$) than male participants (40.85 ± 1.19), Fig. 2 top left: The effect size was -0.34 SD, 95% CI [− 0.48, − 0.19]. Respondents who, prior to the war, resided in the oblasts (administrative geographic districts) that were never occupied by the Russian troops showed lower levels of PTSD symptoms (42.99 ± 1.08) than those in the oblasts that were once occupied but liberated by the time of study completion (45.72 ± 1.23): The effect size was 0.16 SD, 95% CIl [− 0.02, 0.35]. Both groups showed numerically lower PCL-5 scores than the residents of currently occupied oblasts (46.57 ± 0.70), Fig. 2 top right. The contrast between extremes was 0.22 SD, 95% CI [0.07, 0.36]. Experience of displacement came with higher PCL-5 scores as well [displaced: 46.59 ± 0.80; not displaced: 44.61 ± 0.75; effect size 0.12 SD, 95% CI [0.00, 0.24], Fig. 2 middle right. Furthermore, education emerged as a consistent protective factor: the higher the education level of the respondent, the lower the PCL-5 scores [secondary: 47.51 ± 1.22; college: 46.82 ± 0.93; bachelor: 45.39 ± 1.34; higher university degrees: 43.63 ± 0.81], Fig. 2 middle left. The contrast between secondary education and higher university degree was -0.23 SD, 95% CI [− 0.40, − 0.07]. Finally, age showed a nonlinear significant effect on PCL-5 scores ($F(2,1238) = 7.30$, $p < 0.001$), Fig. 2 bottom left. Younger respondents showed lower levels of total severity of PTSD symptoms, while severity steeply increased between ages of 18 and 40 and reached a plateau for respondents older than 40.

Moral Injury

The regression model fitted to MISS scores retained only one significant predictor after the backward stepwise elimination, see Table 3. The significant non-linear effect of age on MISS scores ($F(2,1245) = 13.45$, $p < 0.001$) showed a trend opposite to that found in the PCL-5 scores, see Fig. 2 bottom right panel. The youngest respondents reported the highest levels of moral injury, while scores decreased robustly between ages of 18 and roughly 40 and remained relatively low for all respondents older than 40.

General Discussion

The study pursued two objectives: (RQ1) to determine the prevalence of PTSD symptoms and moral injury in the civilian population that experiences ongoing and long-term warfare; and (RQ2) to determine protective and risk factors that either attenuate or amplify the negative psychological

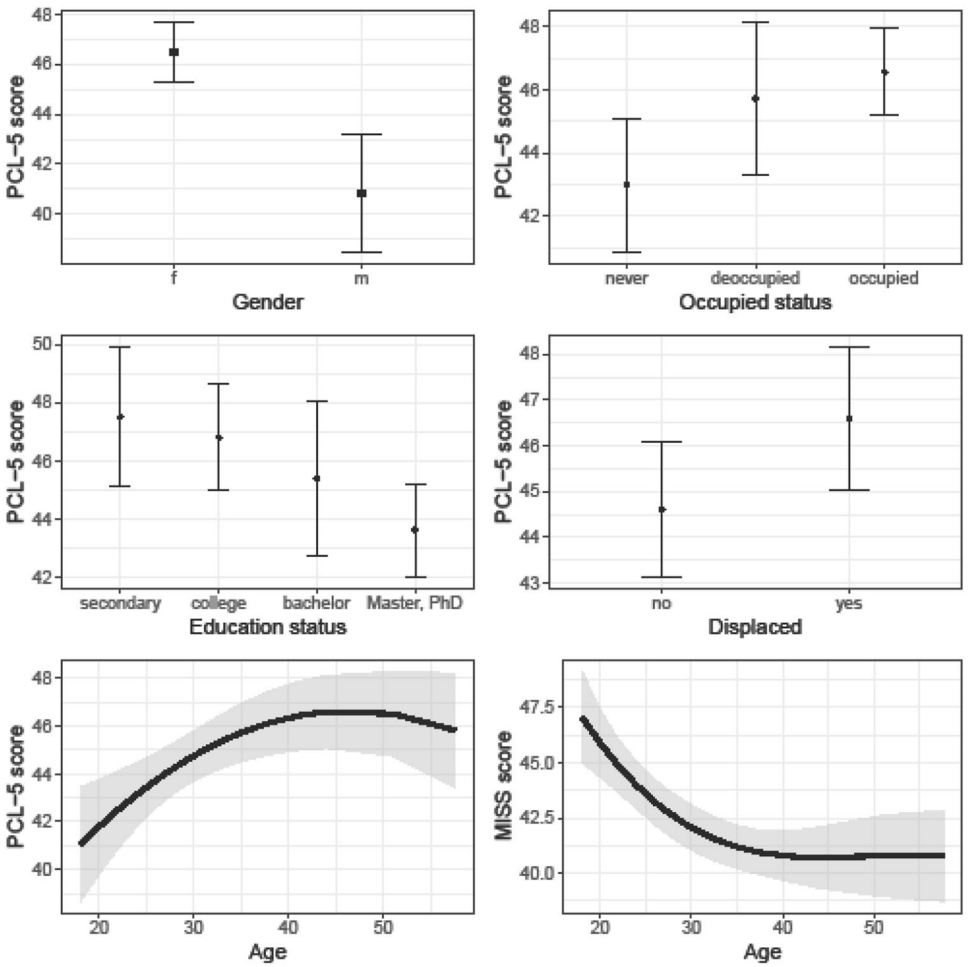


Fig. 2 Partial effects of significant predictors of PTSD Checklist for DSM-5 (PCL-5) scores (top and middle row and bottom left panel) and Moral Injury Symptom Scale scores (bottom right). Error bars stand for ± 1Standard Error. The grey band shows the 95% confidence interval

Table 2 Coefficients of the regression model fitted to PCL-5 scores

Predictor	Estimate	*SE*	*t*	*p*
Intercept	31.36	4.17	7.53	< .001
Age, linear	.64	.23	2.79	.005
Age, quadratic	− .01	0.00	− 2.44	.015
Gender:m	− 5.64	1.23	− 4.59	< .001
Displaced:yes	1.98	1.01	1.95	.051
Occupation:deoccupied	2.73	1.56	1.75	.081
Occupation:occupied	3.58	1.21	2.96	.003
Education:college	− .69	1.41	− .49	.623
Education:bachelor	− 2.12	1.63	− 1.30	.193
Education:Master, PhD	− 3.88	1.42	− 2.73	.006

"Female" is reference level for Gender, "no" for displacement, "never occupied" for Occupation, and "secondary" for Education. Adjusted R-squared = .046. N = 1248

Table 3 Coefficients of the regression model fitted to MISS scores

Predictor	Estimate	*SE*	*t*	*p*
Intercept	56.34	3.14	17.92	< .001
Age, linear	− .67	.17	− 3.96	< .001
Age, quadratic	.01	.00	3.24	.001

. Adjusted R-squared = .020. N = 1248

states in this population. Our analyses provided insights into both RQs based on a large sample of Ukrainian civilians (N = 1249). The sample represents the time period beginning in May 2022–some 2.5 months after the beginning of the full-scale military Russian invasion of Ukraine on February 24, 2022–and covers close to 10 subsequent months of the ongoing hostilities (up to February 2023). All participants in the present sample completed diagnostic questionnaires for PTSD symptoms and moral injury and provided demographic data that links their life circumstances to war-related events (e.g., being displaced or living in the occupied regions). This convenience sample provides a broad representation of the age range, gender (with a skew towards female respondents), geographic regions of Ukraine, and education, displacement status and occupation status of individual respondents.

The main finding for RQ1 was a colossal increase in the prevalence of PTSD symptoms and moral injury among Ukrainian civilians. A comparison with recommended diagnostic cut-offs for both the PCL-5 and MISS scales indicated that those cut-offs were exceeded by three-quarters (PCL-5) and two-thirds (MISS) of the sample respectively. A further comparison with a highly compatible sample of displaced Ukrainians collected in 2016 (i.e., seven years prior to the present data collection) [30] reveals a similarly massive three-fold increase in the prevalence of PTSD symptoms, from 27.4% in 2016 to 74.4% in our study (we acknowledge that this latter percentage may be inflated since we could not use some of the Shevlin et al.'s diagnostic criteria). These outcomes clearly point to the devastating and sweeping psychological aftermath of the civilian population being actively and presently exposed to the atrocities of the war. The observed increase in rates of PTSD symptoms and moral injury could be attributed to prolonged emotional distress of the Ukrainian population. This distress may be caused, firstly, by life threat during the COVID-19 pandemic, which was immediately followed by the Russian invasion, and secondly, low psychological preparedness for the brutality of the Russian invasion. Many Ukrainians have tight family and professional connections with Russia which are rooted in the common Soviet heritage and experienced shock from the violation by geographical neighbours.

Analyses for RQ2 revealed a series of factors that modulate the severity of negative psychological symptoms. Risk factors for PTSD symptoms included gender, with females reporting higher levels of PTSD symptoms. These results are in line with other studies showing that women experience PTSD symptoms more frequently and with greater severity compared to men [20, 30]. Also, there are specific types of traumatic events that women encounter more often than men, especially during the wartime, e.g., sexual assault, reproductive and child sexual abuse, or children being killed, injured or abandoned [2, 30]. Additionally, evidence suggests that gender stereotypes might have a poor impact on women during the wartime: while injured male fighters evoke the pride and support from the community, sexually abused women evoke shame and rejection [19].

Displacement from the pre-war place of residence (either within Ukraine or abroad) was another risk factor for PTSD symptoms. We link the elevated PCL-5 scores in displaced individuals to the greater feeling of loss and often separation from the family. Due to the martial law in Ukraine which prohibits all males in the 18–60 age range from emigration, the majority of displaced individuals are women, children and older adults, who are the most vulnerable populations for experiencing mental health consequences of war atrocities [26]. The most direct connection to the war events emerges in the effect of occupation status as a risk factor. The severity of PTSD symptoms was the highest among residents of presently occupied areas, followed by lower scores in previously occupied but presently liberated areas, followed by even lower scores in the areas that were not occupied by the Russian troops during the war. We identified one protective factor for PTSD symptoms: Higher levels of education correlated with consistently lower PTSD symptom severity.

This finding is contrary to previous meta-analysis studies, which have suggested that demographic factors such as education cannot plausibly explain trauma response [6, 27]. However, our finding is in line with a recent study indicating that low education level is a robust predictor of developing PTSD after experiencing traumatic events during a natural disaster [31]. Further research is needed to examine education level as a protective factor for developing PTSD after exposure to war-related trauma.

A final factor to discuss is age. Age is a risk factor for PTSD symptom severity, which is the lowest for younger adults and the highest for individuals over 40. These results are partially consistent with those of Ditlevsen and Elklit [12] who argue that younger people experience higher PTSD in the absence of acute danger, whereas middle-aged people exhibited most distress in the presence of traumatic events. However, previous studies also suggest that PTSD severity depends more strongly on the social, economic, and cultural context, or personal characteristics and aspects of trauma than on age [12, 27]. Therefore, further investigation is needed to explore the age factor for developing PTSD symptoms among civilians at war.

In contrast to the PTSD symptoms, the youngest respondents reported the highest levels of moral injury. Indeed, age was the only (protective) factor that modulated the severity of moral injury symptoms. Our results corroborate previous findings indicating that younger age is correlated with moral injury symptoms [23]. A possible explanation for this might be that young adults are struggling with developing their personal identity and a sense of self-continuity, which can be complicated by war-related paradoxical ethical situations (political ideas vs actual experience, myth of war vs reality of war, religious belief vs war rules, order vs chaos, dead vs alive) [12, 15]. Chosen behaviour in these situations might cause violation of individual moral values and principles, aligned with developing self-continuity, and serve as a risk factor for moral injury in this age group.

In addition to the research questions of the paper, we add an observation that the association between PTSD and moral injury symptoms was weak in our data. The two sets of scores showed a significant but moderate positive correlation. More importantly, PTSD severity was associated with a number of protective and risk factors, only one of which—age—overlapped with moral injury. Age played

opposite roles for the two psychological states: Older age was a risk factor for PTSD but a protective factor for moral injury severity. This finding strongly suggests that the two tests tap into different facets of the psychological state that arises in response to the atrocities of war. The results of the current research are in line with recent studies that indicate a mechanistically different nature of moral injury and PTSD symptoms despite the association between them and a medium vs strong effect of moral injury on PTSD symptoms in civilians [1, 18].

Study Limitations and Future Directions

One limitation of this study is in that it applies a cross-sectional design and therefore cannot make an argument regarding causality. The online recruitment and participation also may have created a selection bias towards younger and more technologically savvy respondents. Additionally, pre-war baseline data on moral injury and PTSD have not been collected (but see [30]), therefore a longitudinal study might be a natural progression of this work to analyse how moral injury and PTSD as well as their protective and risk factors change over time. Furthermore, this cross-sectional study cannot disentangle the effect of age on psychological states from the generational cohort effects. It is thus possible that the effects that we ascribe to age—an increase in severity of the PTSD symptoms and a decrease in moral injury severity—rather reflect beliefs and values associated with specific generations. A longitudinal study is necessary to disentangle these possible confounds.

Conclusion

To our knowledge, the present study is one of the first to report a large scale set of psychological data collected from the civilian population of Ukraine during the ongoing Russian invasion. It is obvious from the long-term nature of the atrocities and their scope that psychological treatment of the civilian population will be required both presently, while the hostilities are ongoing, and in the future, during the aftermath of the war. It is essential for this task to have a detailed understanding of the psychological response to the traumatic stress, including its overall prevalence and presence in specific demographically and geographically defined groups of the civilian population. This paper makes a step towards this understanding. These findings contribute in several ways to capturing moral injury and PTSD and provide a basis for targeted interventions for civilians with war-related traumas.

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Declarations

Conflict of interest The authors declared no conflicts of interest with respect to the authorship and/or publication of this.

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