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Stress, resilience and sense of self-efficacy among Ukrainian, Polish, Romanian, and Slovak women during the Russian invasion of Ukraine

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Summary

Aim. The aim of the current study was to determine the levels of stress, resilience and the sense of self-efficacy, as well as the influence of resilience and the sense of self-efficacy in shaping stress levels, in a sample of women from various countries of origin.

Material and methods. The study was carried out on a sample of Ukrainian (N = 82), Polish (N = 102), Slovak (N = 79), and Romanian (N = 42) women using the *Sense of Stress Questionnaire*, the *General Self-Efficacy Scale* and the *Brief Resilience Scale*.

Results. Highest total stress levels were found among Ukrainian women, while the lowest were found among Polish women. Simultaneously, Ukrainian women reported the lowest resilience and sense of self-efficacy levels, while the highest levels of these variables were reported by Slovak and Polish women, respectively. There were also observable country-dependent differences in the moderating effect of the sense of self-efficacy on the relationship between resilience and stress.

Conclusions. The current study fills the gap on the topic of women's stress during the Russian invasion of Ukraine. This conflict necessitates further studies on women from Ukraine and from neighbouring countries, together with providing evidence-based support to lower the consequences of experienced stress.

Key words: stress, Ukraine, women

Introduction

Russian invasion of Ukraine radically changed the functioning of citizens of Ukraine as well as citizens of neighbouring countries. After over 70 years since the end of World War II, Europe has once again become an area of war and mass migration from a country engulfed in conflict. Events of this type create a specific psychological situation for the affected population, which necessitates empirical studies.

War is related to traumatic events such as death, physical injury, witnessing acts of cruelty, physical destruction, loss of loved ones, and displacement of large groups of people. The experience of war and the resulting consequences in the form of life losses and psychological harm are extreme experiences. The sense of safety and control over the situation, crucially important for mental health, becomes impaired [1]. Trauma is experienced both by those directly involved in war as well as those who observe others' suffering and offer help, both professionally and as volunteers. It is known that extreme experiences may hamper the ability to adapt to new, objectively safe conditions [2]. For this reason, Ukrainians' further professional and social functioning was related not only to the issue of finding a new place to live.

Studies on the functioning and mental health of Ukrainians during the war with Russia is sparse, and only a small part of them concerns Ukrainian women. However, there are investigations showing that the prevalence of PTSD in the war-affected civilian population reaches 26% [3]. Young et al. [4] noted that women who experienced significant armed conflicts, both as soldiers and as civilians, also suffer permanent psychological harm. A study by Johnson et al. [5] carried out in Ukraine in 2021 showed that 65% of Ukrainians have experienced trauma due to the war. Women from the occupied territories were not only witnesses but also victims of crimes, including sexual violence.

The literature links criminal victimisation with differences in the levels of experienced stress. It has also been described as a probable cause of post-traumatic stress disorder (PTSD) symptoms [6]. The experience of violence also involves loss of control over one's life and the perception of life as unpredictable. One personal resource which allows individuals to better cope with painful experiences is resilience [7]. The sense of self-efficacy also belongs to the group of key traits involved in coping with trauma [8]. Stressful stimuli cause varied reactions in people. According to the theory of stress and coping by Lazarus and Folkman, the individual's perception of the stressful situation determines the type of response [9]. One variable which explains the differences in experiencing stress is age.

Scientific studies covering the study of the Ukrainian population during the ongoing military operations in the territory of the country they inhabit are rare. It is natural that data gathering in such conditions is significantly more difficult. Statistical analyses and

reports made by nongovernmental organisations which also serve as guides for interacting with refugees are commonly available. Studies on female and male Ukrainian refugees carried out in Poland and Ukraine showed that they experienced high levels of anxiety, depression and sleep problems [10]. Analogous results were obtained in a sample of Ukrainian children and adolescents [11]. There is a lack of comparative studies of various countries where citizens are potentially experiencing fear of Russian aggression and are simultaneously engaged in helping Ukrainian refugees.

The aim of the study

The aim of the current study was to establish the levels of stress, resilience and the sense of self-efficacy in relation to the participants' country of origin as well as to determine the role of resilience and the sense of self-efficacy in shaping stress levels in the studied sample. Women from Ukraine, Poland, Slovakia and Romania participated in the study. These are countries which share long borders with Ukraine and which have admitted the highest number of Ukrainian refugees. Additionally, Poland borders both Ukraine and Russia.

Based on the existing research as well as the literature on psychological trauma described above, we assumed that women from Ukraine would report the lowest levels of the measured variables (resilience and self-efficacy), and the highest values for perceived stress. We also assumed that the potential influence of personal resources (resilience and the sense of self-efficacy) and age would be statistically significant.

The following research questions were put forward:

1. What are the levels of stress, resilience and the sense of self-efficacy of the participants from various countries of origin?
2. What role does resilience and the sense of self-efficacy have for stress levels depending on the participants' country of origin?
3. What role does age have for the levels of stress, resilience and the sense of self-efficacy depending on the participants' country of origin?

In the current study, we assumed that the sense of self-efficacy would be a moderating variable in the relationship between resilience and stress. This conceptual model is shown in Figure 1.

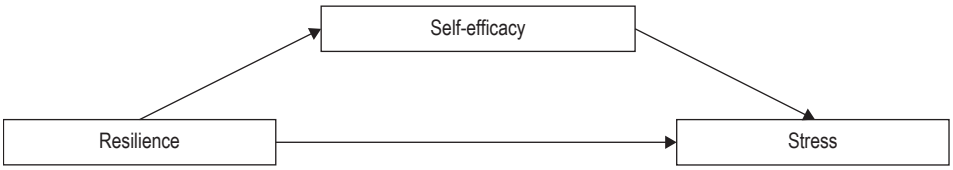

Figure 1. **Conceptual research model**

Material

Ethics statement

Participation in the study was voluntary and anonymous. Each participant gave informed consent to participate. The study was carried out in accordance with the Declaration of Helsinki and the ethical guidelines of the Polish Psychological Association. The study received ethical approval from the National University of Physical Education and Sports in Bucharest (10/2022).

Participants and procedure

The study was carried out via an online form available in the participants' respective native languages. Participants were recruited via the snowball sampling method. Researchers from the participants' respective countries of origin advertised the study via social media. We sought to carry out data collection simultaneously in all the involved countries. Thus, the samples do not have equal sizes due to differences in participant availability. The study was carried out in May 2022 in Ukraine, Poland, Romania, and Slovakia. A total of 305 women participated. Table 1 shows the sample sizes and age for each country. Participants' minimum age was 18, and maximum age was 57.

Methods

Stress

Stress intensity was measured using the *Sense of Stress Questionnaire* [12] by Plopa and Makarowski. The questionnaire consists of three scales such as: *Emotional tension* (7 items, e.g. "I get angry more often than before and for no apparent reason"), *External stress* (7 items, e.g. "I feel exhausted from constantly having to prove that I am right") and *Intrapsychic stress* (7 items, e.g. "Thinking about my problems makes it harder for me to fall asleep"). Participants respond to each question on a 5-point Likert-type scale from 1 ("strongly disagree") to 5 ("strongly agree"). The total score is the sum of the points obtained on the three scales. The higher the number of points, the higher the intensity of stress and its components.

The *Stress Questionnaire* is an expanded version of the *Sense of Stress Questionnaire* by Plopa and Makarowski [13], to which two more scales have been added. It has been used in numerous cross-cultural studies [14, 15].

Self-efficacy

The sense of self-efficacy was measured using the *General Self-Efficacy Scale* (GSES) [16]. The scale comprises 10 items (e.g. "It is easy for me to stick to my aims and accomplish my goals". Participants respond to each item on a 4-point Likert-type scale, from 1 ("not at all true") to 4 ("exactly true"). The higher the score, the higher the sense of self-efficacy. The usefulness of the GSES has been confirmed in numerous cross-cultural studies [17, 18].

Resilience

The *Brief Resilience Scale* by Smith et al. [19] was used to measure resilience. The scale consists of 6 items (e.g. "I tend to bounce back quickly after hard times"). Participants respond to each item on a 5-point Likert-type scale, from 1 ("strongly disagree") to 5 ("strongly agree"). The higher the score, the higher the resilience. The scale's good psychometric properties were confirmed in numerous language versions, for example Spanish, Romanian, Polish, Malaysian, German, and Chinese [20, 21].

Statistical Analysis

The Statistica 13 and AMOS 25 software was used for statistical analyses, which included one-factor analyses of variance and confirmatory analyses [24].

Results

Table 1 shows the sample sizes and age for each country as well as the Cronbach's alpha reliability coefficients for the measures used in the current study.

Table 1. **Sample sizes, age of participants and Cronbach's alpha reliability coefficients for the measures used in the current study**

Country	*N*	*M*	*SD*	Cronbach's alpha					
				Emotional tension	External stress	Intrapsychic stress	Total stress	GSES	Resilience
Poland	102	29.62	7.43	0.85	0.80	0.87	0.91	0.92	0.62
Romania	42	22.67	4.37	0.80	0.70	0.81	0.88	0.91	0.66
Slovakia	79	27.68	7.11	0.76	0.80	0.72	0.87	0.98	0.65
Ukraine	82	28.32	11.24	0.71	0.81	0.77	0.88	0.87	0.67

Women in the Slovakian, Polish, and Ukrainian samples were of a similar age, while the sample of Romanian women was the youngest. Table 2 shows the results of a one-factor analysis of variance for stress levels in the samples. Tukey's test for unequal samples was used. All variables in the current study were normally distributed (skewness and kurtosis were lower than 1.00).

Table 2. **Differences in stress levels among Ukrainian, Polish, Romanian and Slovakian women**

Country	Emotional tension		External stress		Intrapsychic stress		Total stress	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Poland	10.27	3.96	10.98	4.08	9.49	4.20	30.75	10.89
Romania	9.95	3.52	11.26	3.96	10.69	3.91	31.90	10.41
Slovakia	11.62	4.52	12.20	4.67	10.35	4.21	34.18	12.55
Ukraine	14.40	4.43	16.55	4.58	13.95	4.48	44.90	11.32
F	17.78		28.35		18.17		26.27	
p	***		***		***		***	
Differences	1, 2, 3: 4 ***		1, 2, 3: 4 ***		1, 2, 3: 4 ***		1, 2, 3: 4 ***	
f	0.42		0.51		0.43		0.51	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; f = 0.40 indicates a large overall effect size

The highest levels of total stress were reported by Ukrainian women, while the lowest were reported by Polish women. *Emotional tension, External stress*, and *Intrapsychic stress* levels were the highest in Ukrainian women, and the lowest in Polish women. Highest levels of *Emotional tension* were reported by Ukrainian women, while the lowest were reported by Romanian women. The analysis of variance showed that the samples differed in terms of the measured variables. Table 3 shows the resilience results.

Table 3. **Differences in resilience among Ukrainian, Polish, Romanian, and Slovakian women**

Country	*M*	*SD*
Poland	3.29	0.58
Romania	3.31	0.77
Slovakia	3.45	0.72
Ukraine	2.98	0.50
F	6.40	
p	***	

table continued on the next page

Different	1:4*; 3:4***
f	0.27

* p ≤0.05; ** p ≤0.01; *** p ≤0.001; f = 0.25 indicates a medium overall effect size

The highest resilience levels were reported by Slovakian women, while the lowest were reported by Ukrainian women. Table 4 shows the sense of self-efficacy results.

Table 4. **Sense of self-efficacy levels among Ukrainian, Polish, Romanian, and Slovakian women**

Country	***M***	***SD***
Poland	32.47	7.28
Romania	32.17	5.64
Slovakia	31.55	4.53
Ukraine	30.45	5.01
F	36.32	
p	***	
Different	1:3***; 2:3***; 3:4***	
f	0.14	

*** p = 0.001; f = 0.10 indicates a small overall effect size

The highest levels of the sense of self-efficacy were reported by Polish women, while the lowest were reported by Ukrainian women.

Table 5 shows the model fit indices for the four samples.

Table 5. **Model fit indices for Polish, Ukrainian, Slovakian, and Romanian women**

Country	**Chi2**	**p**	**CMIN/df**	**RMSA**	**LO**	**HI**	**GFI**	**AGFI**	***p*–close**	**AICI**
Poland	13.14	0.332	1.664	0.073	<0.001	0.154	0.958	0.890	0.471	39.14
Ukraine	11,78	0.161	1.474	0.076	<0.001	0.163	0.956	0.884	0.279	37.78
Slovakia	9.12	0.110	1.341	0.043	<0.001	0.145	0.952	0.875	0.204	35.11
Romania	6.76	0.562	1.140	<0.001	<0.001	0.164	0.907	0.863	0.633	32.76

RMSEA (Steiger and Lind's approximation error) values were 0.073 in the Polish sample, 0.076 in the Ukrainian sample, 0.043 in the Slovak sample, and lower than 0.001 in the Romanian sample. Browne and Cudeck [25] and Hu and Bentler [26] claim that when RMSEA values are lower than 0.050, the model has good fit to data. According to Steiger [27] and Browne and Cudeck [25], a model fits the data satis-

factorily if the RMSEA value is between 0.060 and 0.080. Values of the PCLOSE test were greater than 0.05 in all samples, which also indicates that the models fit the data well. GFI values should be greater than 0.90, and this was the case in all samples [28, p. 249]. Thus, it can be concluded that our model was verified with the distribution of results from the data matrix.

Figures 2–5 show the models of mutual influence of the sense of self-efficacy, resilience, stress, and age among Romanian, Polish, Ukrainian, and Slovak women.

Figure 2 shows that resilience had the greatest influence on stress levels. The correlation was moderate and negative; Pearson's r coefficient was –0.51. This means that the higher the resilience levels, the lower the stress levels. A similar result was obtained in the Polish and Ukrainian samples. In Slovak women, the correlation between resilience and stress was high, $p = 0.76$.

In all models, the influence of the sense of self-efficacy on stress levels was statistically significant (although the correlations were weak). Pearson's r coefficients ranged from –0.09 to –0.13. In the model for the Ukrainian sample, a moderate to small correlation between age and resilience was observed.

In all four models, a statistically significant influence of resilience on the sense of self-efficacy was observed. Correlations between these variables were moderate, and in the Slovak sample, they were weak.

It should be noted that the assumed theoretical model was confirmed in four independent samples from Poland, Ukraine, Slovakia, and Romania. Accordingly, the influence of resilience on the sense of self-efficacy was observed. The models depicted in Figures 2–5 showed an influence of stress levels on resilience and the sense of self-efficacy, although it is worth noting that the correlations were negative, meaning that resilience and the sense of self-efficacy reduced stress levels.

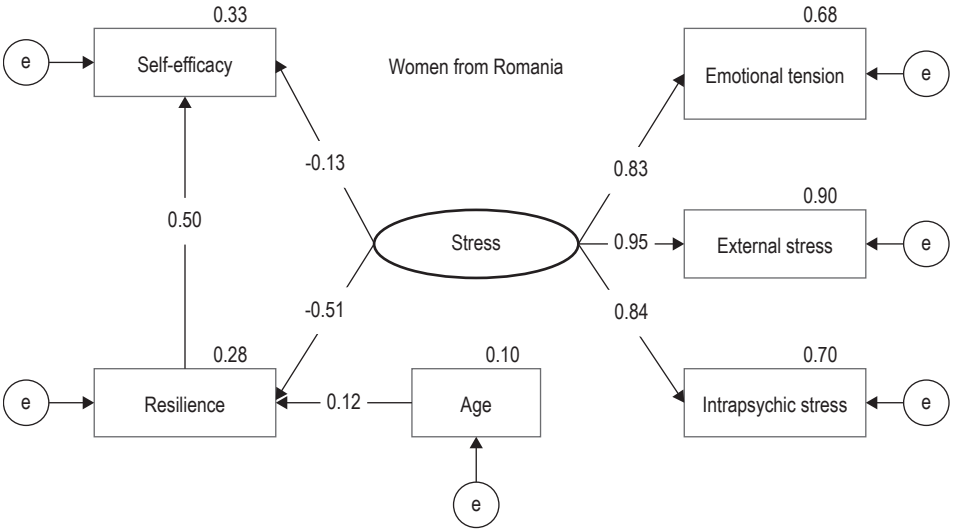

Figure 2. **Model of mutual influence of the sense of self-efficacy, resilience, stress, and age in Romanian women**

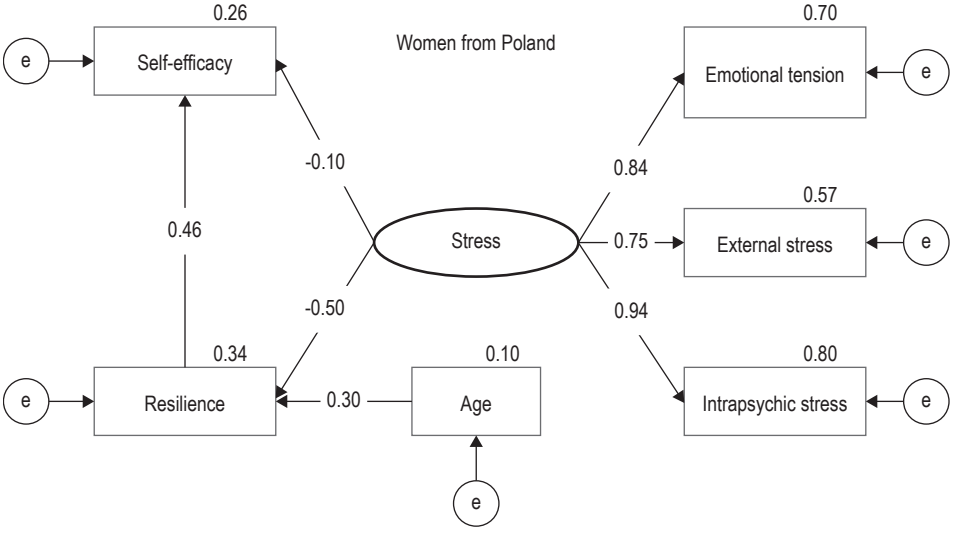

Figure 3. **Model of mutual influence of the sense of self-efficacy, resilience, stress, and age in Polish women**

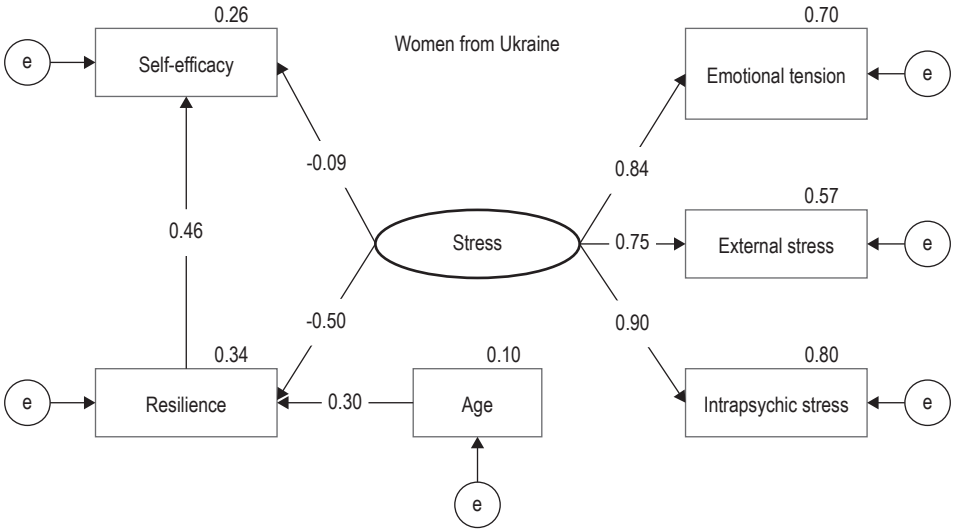

Figure 4. **Model of mutual influence of the sense of self-efficacy, resilience, stress, and age in Ukrainian women**

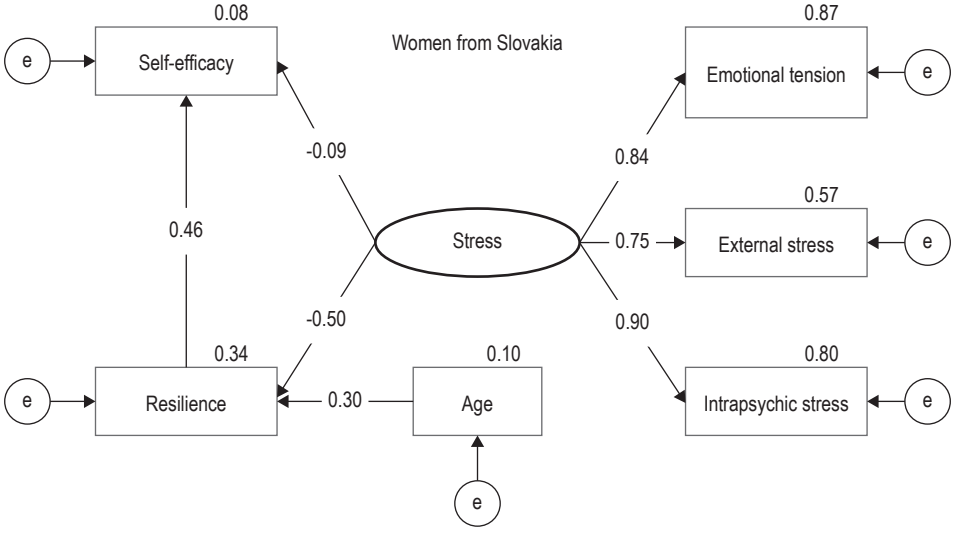

Figure 5. **Model of mutual influence of the sense of self-efficacy, resilience, stress, and age in Slovak women**

Discussion

The recent escalation of Russian aggression on Ukraine began on February 24, 2022. As a result of the direct risk of death, over 6 million people, mostly women and children, left Ukraine. Many of these people crossed the border into Poland, Romania and Slovakia, and remain there to this day. There are few studies on the topic of stress experienced by citizens of a country engulfed in war as well as of the countries where refugees from this conflict are admitted. Due to technological advances, ongoing military combat in Ukraine can be broadcast and available to the general public in each of the countries included in the current study. Simultaneously, the geographical closeness of these countries to Ukraine necessitates the question of the participants' personal safety.

The aim of the current study was to estimate the intensity of the feeling of stress among the group of women in Ukraine, Slovakia, Romania, and Poland in the context of psychological resources: the sense of self-efficacy and resilience. The study, carried out in May 2022, showed that both the total stress levels as well as its constituent factors of *Emotional tension*, *External stress* and *Intrapsychic stress* were the highest in Ukrainian women.

It seems justified to claim that the experience of war in the individual's country of origin impacts their sense of safety and exposes them to health risks. During the Russian invasion, Ukrainian women have experienced greater stress than participants from Poland and Romania, during the COVID-19 pandemic [29]. However, it is not known how the risk of loss of health or life due to COVID-19 was perceived relative to the same risk due to war. The specificity of the region of Ukraine included in the current study may also be significant. Ukraine is large enough for there to occur differences in the personal experiences of war due to the differences in the intensity of Russian attacks to specific areas of Ukraine.

The current study focused on a sample of women. It is known that during wartime, women provide care within the family. Studies on women also yield evidence on the mental health of children's caretakers. The literature shows that traumatic wartime experiences of adult parents cause significant consequences for their children: they may worsen their health or increase their risk of experiencing violence [30–32]. Studies on civilian populations exposed to wartime conditions also have importance beyond examining their mental health. It has been shown that the experience of war as a primary stressor may both exacerbate existing mental health problems as well as cause long-term economic (loss of material resources) and social (disorganisation of social relationships, social isolation) consequences which will impact the functioning of subsequent generations [33, 34]. War trauma not only impacts mental health, but also the broadly understood quality of life [35]. The consequences of experiencing the stress of war are

visible not only via mental health, but also physical health problems [36, 37]. From the point of view of the availability of healthcare in countries affected by war, priority is given to reactive and fundamental activities. This could also be seen as a cost of war.

In our study of women, only stress levels were measured, without categorising the sources of stress. Other research shows that everyday stressors may be a better predictor of mental health than traumatic wartime experiences [38]. However, compared to other study groups, women from countries affected by war reported lower mental health. Existing studies on Ukrainian refugees (N = 1,347) have shown that 41% reported test scores indicating moderate or severe depression, and over 23% reported scores indicating moderate depression or severe anxiety [39]. It seems understandable that our results fit into an overall picture of Ukrainians' poor mental health.

Our model assumed comparative analyses. Our results are consistent with previous studies. An analysis by Joshanloo [40] on representative samples from 116 nations in 2021 showed that Ukrainian citizens rated their mental balance as the lowest compared to Polish, Slovak and Romanian citizens. The conditions in the country are also important for ratings of wellbeing during wartime. The Human Development Index [41] study from 2021 showed that Ukraine ranked 77th in quality of life, while Romania was 53th, Slovakia was 45th, and Poland was 34th. The country's economic, political and social situation is not without significance for the citizens' resources and everyday experiences of stress. The fundamentally and permanently worse situation in Ukraine was additionally and dramatically exacerbated as a result of the Russian invasion, which carried over to stress levels and further diminished the already sparse psychological resources such as resilience and the sense of self-efficacy.

In the current study, we also found that resilience and the sense of self-efficacy levels were the lowest in Ukrainian women. Both resilience and the sense of self-efficacy are resources which allow individuals to cope with both everyday and traumatic events [42–45]. Depletion of personal resources due to a long-term armed conflict and prolonged stress, including traumatic stress, may be exhibited through lower levels of both resilience and sense of self-esteem.

In the literature on the subject, resilience and self-efficacy are most often included in models as predictors of the studied dependent variables. It seems much more difficult to highlight one factor leading to lower resilience and the sense of self-efficacy which would justify our results. Thus far, it has been shown that higher sense of self-efficacy is related to, among others, the male gender, older age or stress exposure [46]. The determinants of resilience described in the literature include biological as well as psychological and cultural factors which interact with one another [47]. Personal factors include, among others, the internal locus of control and optimism [48].

Our analyses seem important from the point of view of real consequences for individuals with a low sense of self-efficacy. Understood globally (as was done in our

study), the sense of self-efficacy refers to a general belief in one's ability to execute effective action in stressful circumstances. An analysis of the literature by Wieland-Lenczowska [49] shows that a low sense of self-efficacy means a lack of adaptation to traumatic events and is manifested by a sense of helplessness and fixation on the trauma [49].

We were also interested in analysing the relationship between the sense of self-efficacy, resilience and age on the one hand, and the experienced stress levels on the other. Our results showed a small correlation between the sense of self-efficacy and stress and a higher correlation between resilience and stress levels. It seems justified to ask why a belief in one's ability to engage in constructive activity (self-efficacy) had a lower impact than resilience for the experience of stress. Resilience is described as a personal competence related to tolerance for stress and acceptance of changes [50]. However, compared to self-efficacy, it is a more multidimensional construct that is more closely related to adaptation to trauma. It changes across time and in interaction with the environment [51, 52]. Ukrainian people's attitudes towards the invaders, exhibited from the first days of the war, may have practical importance for understanding their experiences. The bravery and steadfastness of their leadership, military and civilians has been shown extensively in the media.

Recapitulation

Ukrainian women's war experiences have left a mark on their wellbeing in the form of increased stress and lowered resources. Long-term psychological and social consequences of the ongoing war may be expected. Ukrainian women experience numerous traumatic situations and are thus at risk for significantly lower mental health. Without basic mental healthcare, women suffer as a result of war, which negatively impact them and their loved ones, both currently and long after the war will be over. Psychiatric care providers must consider the long-term impacts of wartime experiences on women as well as their loved ones. For this reason, monitoring Ukrainian women's mental health should continue after the war ends.

Implications

The current study showed that not only Ukrainian, but also Polish, Romanian and Slovak women experienced heightened stress due to the Russian invasion of Ukraine. Women from these countries differed with respect to their levels of psychological resources of resilience and the sense of self-efficacy, which impact the experience of stress. Moreover, cultural differences in stress reactions should be considered in future studies. Governments and healthcare providers should consider the potential long-term and fundamental changes in wellbeing among women exposed to war as well

as women in countries which admit war refugees. Mental healthcare is necessary for women experiencing war trauma, although it is frequently impossible to provide directly in the affected regions. Psychological support for women who have left Ukraine and are currently living in other countries should also consider cultural differences [53].

Limitations

Our study has several limitations. First, the participants were recruited via an online form. Considering the ongoing invasion of Ukraine, this was a practical solution, although it limited the number of responses. Participants of online studies are more often younger and better educated [54]. Second, the cross-sectional nature of the current study precludes causal inferences. Third, the country samples were not equal, which may have impacted the statistical power of the methods we used. Finally, fourth, the intensity of Russian invasion is not equal across all of Ukraine, meaning that the Ukrainian women in our sample could have reported more varied results. Replicating the current study is also justified from a practical point of view. For example, studies on Polish people have shown that the female gender and the passage of time after Russian invasion of Ukraine (from 1 to 6 months) were related to significant changes in the intensity of depressive and anxiety symptoms [55].

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