

# Mental health symptoms and coping strategies among Ukrainians during the Russia-Ukraine war in March 2022

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## Abstract

**Context:** The Russian attack on Ukraine has been ongoing since February 24, 2022. Nevertheless, no research has documented the mental health of Ukrainians during the biggest land war in Europe after the Second World War, or how Ukrainians cope with the impact of the war.

**Objectives:** To provide the prevalence rates of symptoms of psychological distress, anxiety, depression, and insomnia; and to link them with Ukrainians' productive coping strategies during the war.

**Design, setting, and participants:** Online survey conducted in Ukraine during the initial period of the Russian invasion (March 19–31, 2022), using a quota sampling method, of 1,400 Ukrainians aged 18 years or older, with a total of 801 valid responses for a response rate of 57.2%.

**Main outcome measures:** Psychological distress assessed by the Kessler Psychological Distress scale (K6); anxiety assessed by Generalized Anxiety Disorder-2 (GAD-2) scale; depression assessed by Patient Health Questionnaire-2 (PHQ-2); insomnia assessed by Insomnia Severity Index-4 (ISI-4); modes of coping assessed by Brief COPE.

**Results:** Of 801 Ukrainian adults, 52.7% had symptoms of psychological distress (mean = 13.3 [*SD* = 4.9]); 54.1% of them reported symptoms of anxiety (mean = 2.9 [*SD* = 1.7]); 46.8% reported symptoms of depression (mean = 2.6 [*SD* = 1.6]). Symptom criteria for insomnia were met by 97 respondents (12.1%) (mean = 10.4 [*SD* = 4.2]). Demographic variables (including gender, living in an urban area, having children or elderly persons in the household, living in an area occupied by Russian forces) were associated with symptoms of distress, anxiety, depression, and insomnia. The productive coping strategies of using instrumental support, behavioral disengagement, self-distraction, and planning were significantly associated with mental health symptoms.

**Conclusions:** Prevalence rates of symptoms of psychological distress, anxiety, depression, and insomnia were high. These findings underscore the need for healthcare and productive coping strategies for Ukrainians during the war.

## Keywords

Russia-Ukraine war, psychological distress, anxiety, depression, insomnia, coping strategies

## Introduction

Since the Russian invasion of Ukraine on February 24, 2022, there have been more than 10,000 officially reported civilian casualties in the country. This includes a total of almost 5,000 killed and almost 6,000 injured as of June 27, 2022. The actual numbers are likely to be even higher (OHCHR, 2022). Beyond such losses among the military and the civilian population, the war has wider implications, including financial, infrastructural, geopolitical, and health impacts (Zaliska et al., 2022). These implications, notably those for health and healthcare in Ukraine, will be compounded in the days ahead (The Lancet Regional, 2022). Loss of medical facilities and

equipment, an increased need to care for a large number of conflict casualties, and disruptions in the provision of medical supplies are all likely to significantly impact the

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provision of healthcare in Ukraine (The PLOS Medicine Editors, 2022). The war has also undermined the country's ability to deal with the COVID-19 pandemic, reflected, for instance, in the fact that just one-third of the adult population in Ukraine is fully vaccinated at this point (The Lancet Regional, 2022).

Prior studies have examined the detrimental consequences of war and terrorism on mental health, such as acute stress reactions, anxiety disorders, depressive episodes, personality changes, cognitive disorders, or post-traumatic stress disorder (PTSD) among combatants, veterans, refugees, and the general population (e.g., Abu Suhaiban et al., 2019; Bogic et al., 2015; Cardozo et al., 2004; Hoppen et al., 2021; Mohsen et al., 2021). Even before the war broke out, the military conflict between Ukraine and Russia has already brought a variety of mental health issues (e.g., Bryant et al., 2022; Singh et al., 2021). Osiichuk and Shepotylo (2020) compared the population mental health in Ukraine before and during the crisis and suggest that there was an increase in the share of the population with stress symptoms in Ukraine from 45% in 2012 to 50% in 2016. Relatedly, researchers performed a cross-sectional survey of 2,203 Ukrainian internally displaced adults throughout Ukraine in 2016 (Makhashvili et al., 2017; Roberts et al., 2019). The results showed that the prevalence of PTSD was 32%, depression was 22%, and anxiety was 17%.

As people experience traumatic events and stress from the intense ongoing war, mental health risks and psychosocial deterioration may increase and accumulate (Kelly, 2022; Poletti et al., 2022; Vus & Esterlis, 2022; Zaliska et al., 2022). However, very few studies have examined the prevalence of psychological symptoms in Ukraine during the Russian invasion. Surzykiewicz et al. (2022) reported a high prevalence (77.7%) of war anxiety among Polish citizens and Ukrainian refugees in Poland. Kurapov et al. (2022) surveyed students and personnel of four universities in Ukraine and found high prevalences of the emotional states of anger (76.9%), depression (84.3%), nervousness (84.4%), loneliness (51.8%), and exhaustion (86.7%). Therefore, it appears necessary and urgent to examine the prevalence of mental disorders in the general population during the Russian invasion of Ukraine.

Coping refers to "efforts to prevent or diminish threat, harm, and loss, or to reduce associated distress" (Carver & Connor-Smith, 2010, p. 685). Qualitative studies have investigated a series of coping strategies that Ukrainians have adopted to deal with Russia's invasion. For instance, Oviedo et al., (2022) interviewed Ukraine refugees about what helps them cope with this difficult situation and found maintaining communication with separated loved ones, seeking accompaniment, and praying as principal coping strategies. Kostruba and Fishchuk (2022) surveyed university students who sought psychological counseling and found religious media to play an important role in

helping them cope with negative emotions. Furthermore, Khraban (2022) analyzed discourses from posts and comments posted on social media by civilians from northern Ukraine during the first 15 days of conflict and found alternating uses of emotion-focused and problem-focused coping to vent negative emotions, minimize the effect of stressful situations, and induce positive feelings of benevolence and solidarity. Since most of the adopted coping strategies are productive, with very few mentioning of using maladaptive coping such as drugs and alcohol (Konstantinov et al., 2022), we focus on these productive coping strategies in this study.

This paper will investigate how various coping strategies help Ukraine's general population cope with psychological symptoms during the war. Coping strategies can be classified into problem-focused coping and emotion-focused coping (Carver et al., 1989; Folkman & Lazarus, 1980; Lazarus & Folkman, 1984). Problem-focused coping (e.g., active coping, planning, positive reframing, using instrumental support) refers to attempts to actively eradicate the problem. Previous studies have highlighted the role of problem-focused coping in dealing with wars or terrorism. For example, Afghans searched for more food, better housing, and higher income in postwar Afghanistan (Cardozo et al., 2004). Emotion-focused coping (e.g., humor, religion, acceptance, using emotional support, self-distraction, behavioral disengagement) refers to attempts to alleviate discomfort by adjusting the perception or evaluation of the problem. We will investigate the effects of both coping strategies in the Ukraine war.

In order to obtain a representative sample of Ukrainian adults, we conducted a quota sampling survey about their symptoms of psychological distress, anxiety, depression, and insomnia, as well as their coping strategies. The data were collected at the early stage of the invasion, during which active hostilities were taking place throughout the territory of Ukraine. Even territories that are not classified as active fighting areas, that is, those which did not experience direct armed conflict on the ground, still were subject to constant shelling. During March 2022, for example, the Lviv region, the western most region, was shelled simultaneously from Russia and Belarus. During the month, 67 air alarms were announced, their duration varied from 58 minutes to 5 hours 34 minutes, and the largest number of alarms occurred between 00:00 and 06:00 in the morning (Air-alarms, 2022). Only 3 weeks into the war, on March 24, 2022, the Pentagon provided the following figures: during the month of the Russian large-scale invasion, the aggressor used more than 1,200 missiles in Ukraine (U.S. Department of Defense, 2022). Therefore, all the respondents from Ukraine had been in warzones during the time of the survey.

## Methods

### Survey design

We launched an online survey to study the mental health of adults in Ukraine during the initial period of the Russian invasion (March 19–31, 2022). We conducted the survey online to reach people across the entire country and to allow them to participate safely via mobile devices. We used the non-probabilistic technique of quota sampling to approximate a representative sample of Ukrainian adults. Quota sampling is one of the most popular sampling methods and a viable method to conduct online surveys across a country without access to a probabilistic panel (Hays et al., 2015; Ochoa & Porcar, 2018). The use of quota sampling by age, gender, and marital status was effective and viable in our case to obtain a sample that represents the population in Ukraine at that time. The study sampled adults aged 18 years or older by unclustered systematic random samples. The survey, administered in Ukrainian, contained a cover page, which explained the scientific nature of the study, and all the participants consented before starting the survey. Of the 1,400 adults who were invited to participate in the study, we received a total of 801 valid responses for a response rate of 57.2%. Ethical approval for this research was granted by Lviv State University of Physical Culture (#1228032022).

### Instruments

All instruments in this study were self-report questionnaires. Four dependent variables measure mental health symptoms, that is, psychological distress, anxiety, depression, and insomnia. Psychological distress symptoms were measured using the Kessler Psychological Distress Scale (K6) (Kessler et al., 2002) with a range from 0 to 24. A cutoff score of 13 was used to identify symptoms of distress (Kang et al., 2015). Participants were asked to answer the question “Over the last one week, how often did you feel. . .” for the items “nervous,” “hopeless,” “restless or fidgety,” “so depressed that nothing could cheer you up,” “need extra efforts to do everything,” and “worthless” (1=All of the time, 2=Most of the time, 3=Some of the time, 4=A little of the time, 5=None of the time). Cronbach’s  $\alpha$  was .85.

Symptoms of anxiety were assessed using the Generalized Anxiety Disorder-2 (GAD-2) ( $\alpha$  = .75) scale, and symptoms of depression were assessed with the Patient Health Questionnaire-2 (PHQ-2) ( $\alpha$  = .61), having a range from 0 to 6, and using a cutoff score of 3 (Bisby et al., 2022; Staples et al., 2019). Participants were asked to answer the question “Over the last 2 weeks, how often have you been bothered by the following problems?,” including the GAD-2 items “Feeling nervous, anxious or on edge” and “Not being able to stop or control worrying,” and the PHQ-2 items “Little interest or pleasure in doing

things” and “Feeling down, depressed, or hopeless” (0=Not at all, 1=Several days, 2=More than half the days, 3=Nearly every day).

Symptoms of insomnia were measured using the Insomnia Severity Index-4 (ISI-4), ranging from 0 to 28, and using a cutoff score of 15 (Morin et al., 2011; Necho et al., 2021). Participants were asked to rate their recent (i.e., during last 2 weeks) severity of insomnia, including questions such as “How satisfied/dissatisfied are you with your current sleep pattern?” (0=Very satisfied, 1=Satisfied, 2=Moderately satisfied, 3=Dissatisfied, 4=Very dissatisfied). Cronbach’s  $\alpha$  was .84.

Coping strategies were measured using a modified version of COPE, that is, Brief COPE (Carver, 1997). This questionnaire has been used in other war-related studies and has good psychometric properties for the assessment of coping strategies (Karstoft et al., 2015; Solomon et al., 1988; Weisenberg et al., 1993). The scale includes 10 coping strategies, each measured with two items (see Table 1 for details), capturing active coping ( $\alpha$  = .78), planning ( $\alpha$  = .74), positive reframing ( $\alpha$  = .81), acceptance ( $\alpha$  = .79), humor ( $\alpha$  = .76), religion ( $\alpha$  = .83), using emotional support ( $\alpha$  = .84), using instrumental support ( $\alpha$  = .83), self-distraction ( $\alpha$  = .69), and behavioral disengagement ( $\alpha$  = .88) (1=Strongly disagree, 2=Disagree, 3=Somewhat disagree, 4=Neither agree nor disagree, 5=Somewhat agree, 6=Agree, 7=Strongly agree).

All instruments were translated into Ukrainian, taking relevant guidelines into account (International Test Commission, 2017; Wild et al., 2009). Two independent translators were involved; the adaptation consisted of direct translation from English into Ukrainian, back-translation, and cognitive interviews with a pilot group of respondents. The back-translated version was compared to the original version, and any difficulties that arose during the work were discussed and resolved before producing the final version of the instruments.

We also captured several socio-demographic characteristics of the respondents including gender, age, marital status, ethnicity, education levels, the population of their location of residence, occupational status, whether their area of residence was occupied by Russian forces, whether there was active fighting in the area, and whether children and elderly persons live in the same household. Details about each variable and its distributions can be found in Table 2.

### Data analysis

We first performed simple descriptive analyses to understand the characteristics of respondents and the prevalence rate of mental health symptoms. Next, we conducted multivariate analyses to examine the associations between coping strategies and mental health symptoms. We used the cutoff rates mentioned above to treat the four mental

**Table 1.** Items of the Brief COPE, by scale.

Items of the Brief COPE	Mean	SD
Active coping ( $\alpha = .78$ )	4.91	1.21
I've been concentrating my efforts on doing something about the situation I'm in.		
I've been taking action to try to make the situation better.		
Planning ( $\alpha = .74$ )	4.73	1.20
I've been trying to come up with a strategy about what to do.		
I've been thinking hard about what steps to take.		
Positive reframing ( $\alpha = .81$ )	4.16	1.47
I've been trying to see it in a different light, to make it seem more positive.		
I've been looking for something good in what is happening.		
Acceptance ( $\alpha = .79$ )	4.96	1.40
I've been accepting the reality of the fact that it has happened.		
I've been learning to live with it.		
Humor ( $\alpha = .76$ )	3.07	1.56
I've been making jokes about it.		
I've been making fun of the situation.		
Religion ( $\alpha = .83$ )	4.58	1.68
I've been trying to find comfort in my religion or spiritual beliefs.		
I've been praying or meditating.		
Using emotional support ( $\alpha = .84$ )	5.06	1.30
I've been getting emotional support from others.		
I've been getting comfortable and understanding from someone.		
Using instrumental support ( $\alpha = .83$ )	4.60	1.38
I've been trying to get advice or help from other people about what to do.		
I've been getting help and advice from other people.		
Self-distraction ( $\alpha = .69$ )	4.91	1.29
I've been turning to work or other activities to take my mind off things.		
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.		
Behavioral Disengagement ( $\alpha = .88$ )	2.94	1.40
I've been giving up trying to deal with it.		
I've been giving up the attempt to cope.		

health outcomes as binary variables. Correspondingly, we used logistic regression models to examine the relationship between coping strategies and mental health outcomes.

## Results

### Sample characteristics

As shown in Table 2, respondents had an average age of 35.5 years, with more than half (59.9%) being female. Nearly all belong to the Ukrainian ethnic group (99.4%). Since the data were collected quite early in the war, the vast majority of people who responded did not live in areas that were already occupied by Russian forces (96.4%) or characterized by active fighting (93.5%). It is important to note that 'active fighting' refers to active fighting on the ground between the Ukrainian and Russian armies. Even non-active-fighting areas were subject to frequent missile attacks. 45.8% of the respondents lived in urban areas with

more than 100,000 inhabitants, 31.6% lived in rural areas, and 22.6% lived in urban areas with less than 100,000 inhabitants. 63.2% of participants were married or cohabiting, followed by 30.3% being single, and 6.5% being divorced, separated, or widowed. Around 59.1% of the respondents had a university education. In terms of occupation status, most participants were employees (48.4%), followed by students (29.3%), self-employed (12.5%), unemployed (5.9%), and pensioners (3.9%). Most respondents had elderly persons (e.g., parents, grandparents) living in the same household (71.3%), and more than half (55.6%) of participants had children (under 18 years of age) living in the same household.

### Mental health

As shown in Table 3, during the initial stage of the invasion, more than half of Ukrainian adults exhibited psychological distress and anxiety symptoms. The mean value regarding psychological distress was 13.3 (Standard

**Table 2.** Characteristics of studied Ukrainian adults.

Characteristics	No. (%) of Ukrainian adults <sup>a</sup>
	Total (N=801)
Age of Ukrainian adults, mean (SD) [range], in years	35.5 (13.6) [18–86]
Gender	
Male	321 (40.1)
Female	480 (59.9)
Marital status	
Single	243 (30.3)
Married/cohabiting	506 (63.2)
Divorced/separated/widowed	52 (6.5)
Ethnicity <sup>b</sup>	
Ukrainian	792 (99.4)
Russian	5 (0.6)
Education	
Primary school/secondary school	53 (6.6)
College/vocational school	170 (21.2)
University	473 (59.1)
Postgraduate	105 (13.1)
Population of location	
Rural area	253 (31.6)
Urban area < 100,000 habitants	181 (22.6)
Urban area > 100,000 habitants	367 (45.8)
Area occupied by Russian forces	
Yes	9 (1.1)
Partially	20 (2.5)
No	772 (96.4)
Active fighting in area <sup>b</sup>	
Yes	40 (5.0)
No	746 (93.5)
Do not know	12 (1.5)
Occupational status	
Self-employed	100 (12.5)
Employee	388 (48.4)
Student	235 (29.3)
Unemployed	47 (5.9)
Pensioner	31 (3.9)
Children (under the age of 18 and living in the same household)	
Yes	445 (55.6)
No	356 (44.4)
Elderly persons (e.g., parents, grandparents) living in the same household	
Yes	571 (71.3)
No	230 (28.7)

<sup>a</sup>Percentages are weighted and adjusted for survey design.

<sup>b</sup>As reported by the respondent.

Deviation [ $SD$ ]=4.9), for a prevalence rate of 52.7%. The mean value for anxiety was 2.9 ( $SD$ =1.7), and 54.1% of respondents scored above the cutoff for anxiety symptoms. The prevalence rate of depression symptoms was slightly lower (46.8%) with a mean value of 2.6 ( $SD$ =1.6).

Symptom criteria for insomnia were met by 12.1% of respondents, with the mean value of 10.4 ( $SD$ =4.2).

### *Sociodemographic factors, coping strategies, and mental health symptoms*

We employed multivariate logistic regression models to assess the association between selected demographic factors and coping strategies with mental health outcomes. Table 4 shows that male participants were more likely to exhibit the symptom of psychological distress ( $z=3.78$ ,  $SE=0.31$ ,  $p<.001$ ), while female participants were more likely to suffer from the symptoms of anxiety ( $z=-5.83$ ,  $SE=0.06$ ,  $p<.001$ ), depression ( $z=-4.23$ ,  $SE=0.08$ ,  $p<.001$ ), and insomnia ( $z=-2.14$ ,  $SE=0.15$ ,  $p<.05$ ). Respondents living in urban areas with more than 100,000 inhabitants ( $z=2.59$ ,  $SE=0.19$ ,  $p<.05$ ) experienced higher levels of insomnia than those living in rural areas. Respondents living with children had more insomnia ( $z=2.50$ ,  $SE=0.46$ ,  $p<.05$ ), and those living with elderly persons had higher symptoms of depression ( $z=2.19$ ,  $SE=.27$ ,  $p<.05$ ). This may be because children and elderly people are particularly vulnerable groups during the war. Hence, people living with them had more psychological symptoms, possibly due to their responsibilities to care for them besides themselves. Respondents living in Russian-occupied areas experienced higher anxiety levels ( $z=2.00$ ,  $SE=2.91$ ,  $p<.05$ ).

In terms of coping strategies, using instrumental support ( $z=-2.50$ ,  $SE=0.07$ ,  $p<.05$ ) and behavioral disengagement coping ( $z=-4.27$ ,  $SE=0.05$ ,  $p<.001$ ) were negatively associated with the symptom of psychological distress. Self-distraction coping was negatively associated with the symptom of anxiety ( $z=-2.74$ ,  $SE=0.06$ ,  $p<.01$ ), depression ( $z=-2.31$ ,  $SE=0.06$ ,  $p<.05$ ), and insomnia ( $z=-2.15$ ,  $SE=0.09$ ,  $p<.05$ ), but was positively related to the symptom of distress ( $z=2.03$ ,  $SE=0.09$ ,  $p<.05$ ). Active coping was positively associated with the symptom of anxiety ( $z=2.23$ ,  $SE=0.11$ ,  $p<.05$ ), and planning was positively associated with the symptom of insomnia ( $z=2.42$ ,  $SE=0.20$ ,  $p<.05$ ). Using instrumental support was positively related to the symptom of anxiety ( $z=2.51$ ,  $SE=0.09$ ,  $p<.05$ ). Our results also showed a positive relationship between behavioral disengagement and the symptoms of depression ( $z=2.47$ ,  $SE=0.07$ ,  $p<.05$ ) and insomnia ( $z=2.98$ ,  $SE=0.12$ ,  $p<.01$ ).

## **Discussion**

Wars generally pose a substantial threat to civilian mental health (Murthy & Lakshminarayana, 2006). In contrast to prevalence rates of anxiety and depression (17% and 22% respectively) reported in 2016 (Makhashvili et al., 2017), more than half of Ukrainian adults suffered from symptoms of psychological distress and anxiety, and nearly half

**Table 3.** Mental health outcomes (N=801).

Symptoms	Symptoms mean (SD)	Ukrainians with symptoms no. (%)
Psychological distress	13.3 (4.9)	422 (52.7)
Anxiety	2.9 (1.7)	433 (54.1)
Depression	2.6 (1.6)	375 (46.8)
Insomnia	10.4 (4.2)	97 (12.1)

**Table 4.** Variables predicting mental health outcomes.

	Psychological distress	Anxiety	Depression	Insomnia
<b>Demographics</b>				
Male gender	3.78***(0.31)	-5.83***(0.06)	-4.23***(0.08)	-2.14* (0.15)
Age	-0.27 (0.01)	0.88 (0.01)	0.98 (0.01)	1.64 (0.01)
Marital status	-0.23 (0.19)	1.36 (0.27)	0.13 (0.20)	-0.82 (0.25)
Ethnicity	0.78 (3.09)	-1.21 (0.30)	-0.51 (0.62)	N/A
Education	1.11 (0.12)	-0.22 (0.11)	-0.74 (0.10)	0.84 (0.22)
Population of the location	1.11 (0.10)	1.61 (0.10)	1.90 (0.10)	2.59* (0.19)
Area occupied by Russian forces	-1.88 (0.18)	2.00* (2.91)	1.33 (1.16)	0.77 (1.10)
Active fighting in area	-0.34 (0.33)	0.96 (0.61)	-0.54 (0.30)	0.53 (0.67)
Occupation	0.41 (0.06)	1.35 (0.60)	1.14 (0.06)	1.88 (0.09)
Children	-0.41 (0.15)	-1.03 (0.14)	1.29 (0.20)	2.50* (0.46)
Elderly persons	-0.61 (0.16)	-0.42 (0.17)	2.19* (0.27)	-0.07 (0.27)
<b>Coping strategies</b>				
Active coping	0.23 (0.09)	2.23* (0.11)	1.60 (0.11)	-1.18 (0.12)
Planning	0.53 (0.09)	0.93 (0.09)	1.11 (0.10)	2.42* (0.20)
Positive reframing	0.01 (0.07)	-0.54 (0.06)	-0.35 (0.06)	0.07 (0.10)
Acceptance	1.78 (0.08)	-1.79 (0.06)	-0.68 (0.06)	0.14 (0.12)
Humor	-0.46 (0.05)	0.90 (0.05)	1.36 (0.06)	-0.12 (0.09)
Religion	-1.05 (0.05)	1.71 (0.06)	-0.60 (0.05)	0.85 (0.09)
Using emotional support	1.88 (0.11)	-1.12 (0.08)	-1.65 (0.08)	-0.26 (0.15)
Using instrumental support	-2.50* (0.07)	2.51* (0.09)	1.39 (0.09)	1.19 (1.53)
Self-distraction	2.03* (0.09)	-2.74***(0.06)	-2.31* (0.06)	-2.15* (0.09)
Behavioral disengagement	-4.27*** (0.05)	1.61 (0.06)	2.47* (0.07)	2.98***(0.12)
Pseudo R <sup>2</sup>	0.08	0.09	0.05	0.08

Note. Standard errors in parentheses.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  (two-tailed tests).

of them experienced depression symptoms. These results are consistent with previous studies that showed an increase in the incidence and prevalence of mental disorders (e.g., PTSD, stress) among US combat veterans (e.g., Cigrang et al., 2014) or the general population during the Russian-Ukrainian conflict (e.g., Osichuk & Shepotylo, 2020).

To counter the impact of the war, the present study also examined which coping strategies that Ukrainians adopted were associated with these psychological disorders. Our findings suggest that seeking instrumental support was negatively related to psychological distress but positively associated with anxiety. This may be because anxious people are more likely to seek instrumental support. As shown by Bleich et al. (2003), instrumental social support coping was one of the most prevalent strategies (81.2%) adopted by residents of Israel to cope with traumatic stress

and PTSD symptoms after terrorist attacks. An empirical study of the coping strategies of Ukrainian military personnel in anti-terrorist operations also showed a negative relationship between PTSD symptoms and the coping strategy of seeking social support (Turetska & Stoltzel, 2016).

In addition, we found that active coping was positively associated with symptoms of anxiety, and planning was positively associated with symptoms of insomnia. Previous literature also found that people adopted active coping and planning strategies to cope with stress. For example, Cherkashyn (2021) found that proactive coping such as “problem solving planning” was one of the main coping strategies for Ukrainian students in stressful situations. Positive reframing, however, was not related to Ukrainians’ mental health symptoms at the early stage of the Russia-Ukraine war. Previous research has found that positive

reframing such as looking on the bright side of things was adopted by Israeli citizens to combat psychological distress suffered from the chronic threat of terrorism (Dickstein et al., 2012). The reason why it was not adopted or effective for Ukrainians maybe because this war escalated so quickly and intensively that they might not be able to see it in a positive way.

Behavioral disengagement coping, such as giving up the attempt to cope, was negatively related to psychological distress but was positively related to depression and insomnia. Self-distraction coping was positively associated with symptoms of psychological distress but negatively associated with anxiety, depression, and insomnia. These findings are consistent with those in prior research. For instance, Weisenberg et al. (1993) found that after a minimum level of measures had been taken, avoidance and distraction strategies were related to less post-Persian Gulf War stress reactions. De Jong et al. (2004) also indicated that keeping busy to take their mind off things helped displaced people from Chechnya to cope with trauma. Turetska and Stoltzel (2016) also found a positive relationship between PTSD symptoms and problem avoidance in Ukrainian military personnel.

Emotion-focused coping strategies, such as humor, religion, and using emotional support, were found to be unrelated to psychological symptoms for Ukrainians in the initial stage of the war. The terrible situation of a war may simply make it hard for people to make jokes or fun of the situation. Seeking emotional support and religious coping, which were found to mitigate mental health symptoms (e.g., anxiety, depression, or PTSD) in previous wars (Cardozo et al., 2004; De Jong et al., 2004; Greenawalt et al., 2011; Kroo & Nagy, 2011; Scholte et al., 2004), did not relate to any psychological symptoms among Ukrainians.

Our results show that problem-focused coping strategies adopted by Ukrainians had a positive relationship with mental health symptoms, whereas emotion-focused coping strategies had mixed effects, that is, they are positively related to some symptoms and negatively related to other symptoms. According to Hobfoll et al. (1991), emotion-focused coping strategies may initially be very successful when attempting to cope with extremely stressful events. In the long term, however, emotion-focused coping was found to be associated with an increase in the prevalence and severity of PTSD symptoms among soldiers years after combat (Solomon et al., 1988, 1989). The mixed effects found in our study invite longitudinal research to disentangle the causal relationships between emotion-focused coping and psychological symptoms. Nonetheless, the mixed relationships between naturally adopted coping strategies and mental health issues highlight the need for professional psychological interventions in Ukraine.

Unfortunately, currently available interventions by mental health care providers and facilities in Ukraine are often not evidence-based (World Bank Group, 2017). Posing a crucial issue (World Bank Group, 2017). Based on a survey conducted in Ukraine in 2017, it is estimated that mental illness affects 33% of the population but only 4.9% of those affected receive treatment (Hook et al., 2021; World Bank Group, 2017). Meta-analytical evidence shows that mental health symptoms in Ukraine and Eastern Europe are highly prevalent (Zhang et al., 2022). Barriers to seeking care include geographical distance, stigma and shame, lack of knowledge and awareness, the high cost of therapy, fear of psychiatry, and a lack of faith in the healthcare system (World Bank Group, 2017). The continuing COVID-19 pandemic has already placed a tremendous amount of stress on the healthcare system and healthcare professionals, and the Russian invasion has further exacerbated this problem. Providing further education and training on mental health to physicians and psychologists may help. Furthermore, providing additional outreach services to people in Ukraine may be useful.

Several limitations must be acknowledged. First, our findings are based on a cross-sectional survey during the ongoing Russia-Ukraine War, and we hence cannot make a causal argument about the relationship between psychological symptoms and coping strategies. It seems plausible that the relationship would be circular, such that coping strategies affect symptoms, which in turn, lead to changes in coping (Solomon et al., 1990). Indeed, Solomon et al. (1988) find that although psychological symptoms have an impact on their choice of coping strategies, their coping responses in turn make a distinct impact on the development of mental health issues. The nature of this relationship and the direction of causality should be further clarified in subsequent longitudinal studies looking at the association between coping strategies and mental health symptoms over time. Finally, our study focused on productive coping strategies. Strategies such as drugs and alcohol are potentially non-productive strategies to cope with the threat brought by the war (e.g., Alaryan et al., 2021; Ikin et al., 2004). For example, according to a survey among approximately 2,000 internally displaced persons in Ukraine in 2016, 8.4% of men and 0.7% of women screened positive for alcohol use disorder (Ramachandran et al., 2019). Future research might study unproductive coping strategies, for example, substance and alcohol abuse (Fear et al., 2010; Walton et al., 2021).

## Conclusion

The study provides early evidence on mental health symptoms – including psychological distress, anxiety, depression, and insomnia – during the Russian invasion. Ukrainians under the Russian invasion have adopted

various productive problem-focused coping strategies such as active coping and planning as well as emotion-focused coping strategies such as using instrumental support, behavioral disengagement, and self-distraction to cope with these mental health challenges. These findings underscore the need for professional healthcare and psychological counseling for citizens during the war.

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### Transparency declaration

We affirm that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as originally planned (and, if relevant, registered) have been explained.

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