

## Posttraumatic stress disorder: online poll of people who experienced war stress in Ukraine in 2022

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<https://doi.org/10.47855/jal9020-2022-2-4>

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Received: 30.04.2022; Accepted: 02.05.2022; Published: 03.05.2022

**Abstract.** The gold standard for diagnosing PTSD is structured clinical interviews, the PCL-5 scale. To use of this English-language translator in Ukraine, we have made a translation to the Ukrainian language. For the collection of data, we use the online method which was divided by the Google company (Google Forms). Our task was to measure the frequency of PTSD development in different groups of people who survived the military stress in Ukraine from February -to April of 2022. The interview was taken with 212 persons years of aged 18 to 82 years, which live in Kyiv and before the city. The experiment was carried out from April 14 to May 17, 2022. The incidence of PTSD in people who were in the war zone was 43.1%, and in refugees - 27.5%. At the same time, in people who were outside the combat zone, the incidence of PTSD was significantly lower - 18.6%. Thus, the verification of the PCL-5 scale on the Ukrainian population of people affected by the war showed that this scale adequately assesses the severity of war stress and can be used for diagnostic PTSD.

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**Keywords:** war stress, posttraumatic stress disorder, Ukraine-2022

The problem of military stress and post-traumatic stress disorder (PTSD) has now become one of the leading medical and medical-social problems of modern society. Military stress has a significant impact on long-term human health. There is growing evidence that PTSD is associated with an increased risk of somatic disease and early mortality [1-5].

PTSD is a syndrome that can result from a person's severe mental or physical trauma. In order to diagnose PTSD and assess its severity in combat veterans, the Mississippi PTSD scale was developed [6-9]. The scale contains statements that reflect the condition of people who have experienced a traumatic situation. The presence of PTSD in humans can indicate a significant decrease in psychological stability: there is a loss of meaning in life, protective barriers are broken, the structure of self-awareness changes, attitudes toward others and themselves change, and the basic personality structures are destroyed. It is believed that post-traumatic reactions are normal reactions to abnormal circumstances, and severe stress causes such reactions in anyone. However, post-traumatic reactions and their long-term consequences vary greatly from person to person. It has been shown that only 20% of survivors of trauma subsequently have serious psychological problems, while the majority use their self-control abilities, which allow them to successfully adapt and readapt after a traumatic experience [10].

In a recent study by the Department of Veterans Affairs, about 30% of the 834,463 veterans in Iraq and Afghanistan had PTSD [1]. Non-military people at risk of developing PTSD are victims of war, the Holocaust, natural disasters or criminal and terrorist attacks, or victims of rape and child abuse. 12 to 15% of patients with acute coronary syndromes or myocardial infarction have PTSD [2].

The reported prevalence of PTSD is usually twice as high in women [11]. Along with the increased risk of depression, alcohol, nicotine, and psychoactive substance abuse, people with PTSD have

a higher incidence of various disorders, including obesity, hypertension, dyslipidemia, cardiovascular disease, metabolic syndrome, and diabetes mellitus.

PTSD usually occurs in response to external stress, but it causes enormous internal distress [12]. Chronic effects of biochemical changes associated with stress accelerate physiological aging and contribute to the development of age-related diseases and early mortality [13]. People with PTSD have chronic excitation of the sympathetic nervous system, as evidenced by elevated levels of catecholamines in plasma and daily urine [14]. PTSD is characterized by tremors and other symptoms of autonomic excitation. In patients with PTSD, activation of the sympathetic nervous system is manifested by significantly higher heart rate and blood pressure compared to the control group, even during sleep [15, 16]. Age-adjusted patients with PTSD have a higher prevalence of reduced heart rate variability compared with non-traumatic controls, consistent with increased sympathetic and decreased parasympathetic tone at baseline and in various affective conditions [17]. Sympathetic arousal plays a key role in the activation of the renin-angiotensin-aldosterone system and in the pathogenesis of hypertension and insulin resistance. Cross-interactions between catecholamine and insulin signaling pathways establish a metabolic environment that dulls insulin sensitivity and promotes the development of the metabolic syndrome and type 2 diabetes in susceptible individuals [18]. Chronic stress can cause weight loss due to catabolic and anorexic reactions in some people [19], but weight gain in others. Thus, a timely diagnosis of PTSD is important to assess the risk and prevent the development of stress-dependent pathology.

The purpose of the work is to study the frequency of PTSD in different groups of people who experienced military stress in Ukraine in February-April 2022.

## Materials and methods

The gold standard for the diagnosis of PTSD is a structured clinical interview, PTSD scale (CAPS-5). The PTSD checklist, known as PCL, is a self-test tool that helps diagnose PTSD. If necessary, PCL-5 can be evaluated to provide a preliminary diagnosis of PTSD. The final diagnosis can be made only by an appropriately qualified clinician [1].

To diagnose PTSD, we used the English-language PCL-5 questionnaire <http://traumadissociation.com/pcl5-ptsd>. PCL-5 is a 20-point self-report that measures 20 symptoms of DSM-5 PTSD. To use the English-language questionnaire in Ukraine was translated into Ukrainian.

The online method developed by Google (Google forms) was used for data collection. This method allows you to distribute the questionnaire on the Internet and get information about the answers to her questions in the form of a Google spreadsheet on Google Drive. We have developed a Google form of the questionnaire that includes the 20 signs of PTSD listed above. This questionnaire can be downloaded from the browser at <https://forms.gle/eCw3d33TUyJu4kMp6>.

The following items were added to the online questionnaire ("Zone" factor):

1. Was not in a war zone (Not a war zone).
2. He was a refugee (Evacuation zone).
3. Was in the war zone (War zone).

In addition, the questionnaire asked about the subjective assessment of stress (factor "Stress"):

1. Not felt or weak (Soft).
2. Medium strength (Middle).
3. Extreme (Extreme).

212 people aged 18 to 82, mostly living in Kyiv and the suburbs, were interviewed. Respondents were affected by the stressful events of the war in February-April 2022. The poll was conducted from April 14 to May 17, 2022. The subjects were divided by age ("Age factor") into two groups: 1 - up to 50 years, 2 - 50 years, and older. To diagnose PTSD, the scores on each question were summarized. If the score (Scores) exceeded 38, PTSD was diagnosed.

Statistical data processing was performed using Microsoft Office Excel 2007, Statistica 7.0 (StatSoft, USA). Differences between groups were assessed by ANOVA. Differences between groups at  $p < 0.05$  were considered significant.

## Results and discussion

The development of PTSD depends on the strength of the traumatic impact. In our study, this strength was determined by whether the person was in a war zone, evacuated (refugee), or stayed at home where there was no fighting (the "Zone" factor). Therefore, all people were divided into three groups according to the "Zone" factor. Table 1 shows the characteristics of these groups of people.

As can be seen from Table 1, the average age of people in different location groups does not differ significantly. At the same time, other indicators differ significantly. In groups of people who were refugees or were in the war zone, compared with people who did not experience war stress, a higher average score, a higher level of subjective assessment of the stress experienced, and a higher proportion of people diagnosed with PTSD. When comparing refugees and people who were in the war zone, no significant differences were found in the indicators. At the same time, in the group of people who were in the war zone, the highest incidence of PTSD.

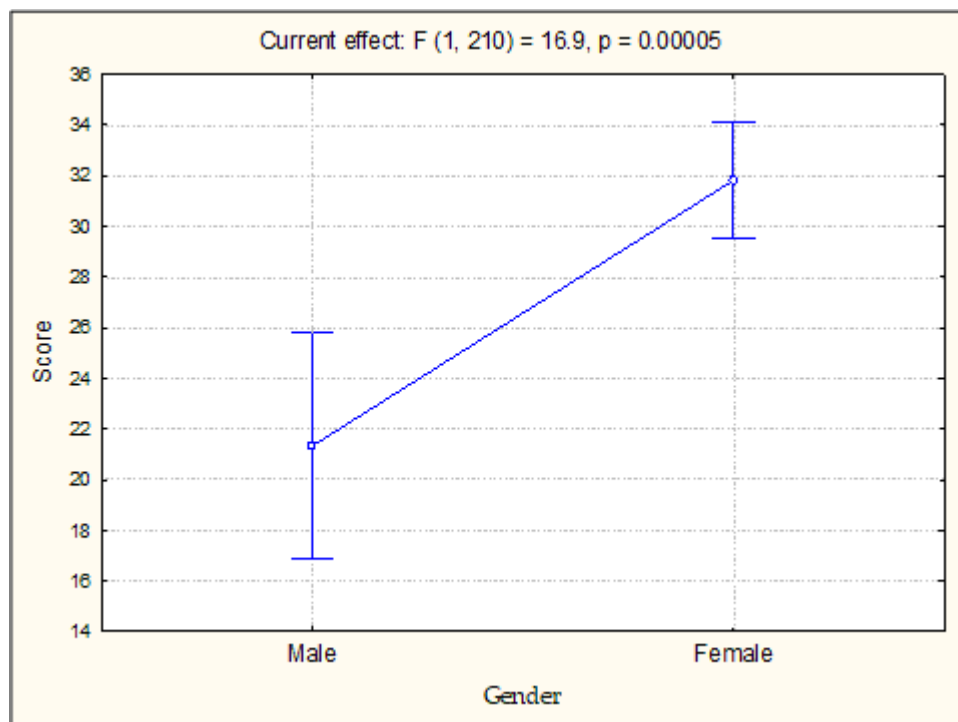
Table 1

Characteristics of groups of people at different values of the factor "Zone"

	Not a war zone	Evacuation zone	War zone
Age, years	42.79 ± 2.65	41.54 ± 2.31	38.09 ± 1.38
Stress, points	1.48 ± 0.09	1.92 ± 0.09*	2.12 ± 0.06*
Scores	18.13 ± 2.16	30.14 ± 2.12*	31.82 ± 1.48*
PTSD, %	18.6	27.5*	43.1*

Note: \* -  $p < 0.05$  compared to the group "Not a war zone"

To assess the influence of the "Gender" factor on the scores according to the PCL-5 questionnaire, a one-way analysis of variance was performed. The results are shown in Figure 1. The results of ANOVA analysis showed (Fig. 1) that the "Gender" factor significantly affects the total scores on the PCL-5 questionnaire ( $F = 16.90$ ,  $p = 0.00005$ ).



**Figure 1.** Influence of the "Gender" factor on the total scores (Scores) according to the PCL-5 questionnaire.

Therefore, it is necessary to analyze the influence of other factors separately for each gender. Considering that the number of examined men (16.4%) is not enough for such an analysis, it was performed only on women.

To assess the influence of the "Age" factor on the sum of points received by women according to the PCL-5 questionnaire with three values of the "Zone" factor, two-factor analysis of variance was performed. The results are shown in Figure 2 and in Table 2.



**Figure 2.** Influence of the "Age" factor on the total scores (Scores) according to the PCL-5 questionnaire in women who were in different zones.

As can be seen from Figure 2, the total scores obtained are significantly higher for women who were in the war zone or refugees compared to women who were not in the war zone. At the same time, there was no significant effect of the "Age" factor on the total scores on the PCL-5 scale in women who were in different zones (ANOVA:  $F = 0.167$ ,  $p = 0.847$ ).

Table 2

**Influence of the "Age" factor on the total scores (Scores) according to the PCL-5 questionnaire in women who were in different zones**

Age groups	Zone	N	Scores (M ± m)
Age <50 years	Not a war zone	14	23.14 ± 4.51
	Evacuation zone	30	31.03 ± 2.55*
	War zone	72	34.83 ± 1.80*
Age >= 50 years	Not a war zone	17	22.06 ± 3.28
	Evacuation zone	16	31.69 ± 4.10*
	War zone	18	31.94 ± 3.65*

**Note:** \*–  $p < 0.05$  compared to the "Not a war zone" group for each age group

As can be seen from the data given in table 2, the mean scores on the PCL-5 questionnaire were significantly higher for women who were in the war zone or were refugees. However, there are no significant differences in the number of points scored according to the questionnaire between different age groups. Perhaps, when divided into three age groups, the differences will be significant. But for such a separation, there is not enough data in the group older than 60 years.

To assess the influence of the "Stress" factor on the total scores according to the PCL-5 questionnaire in women who were in different zones, two-factor analysis of variance was performed. The results are shown in figure 3 and in table 3.

As can be seen from Fig. 3, the sum of points received by women on the PCL-5 scale is greater, and the stronger the subjective assessment of stress (ANOVA:  $F=2.41$ ,  $p=0.05$ ). This is confirmed by the data given in Table. 3. The average score on the PCL-5 questionnaire was significantly higher in women who, according to their subjective assessment, experienced moderate or extreme stress. However, there are no significant differences in the average scores scored according to the questionnaire between groups of women who experienced moderate and extreme stress.

The incidence of PTSD in women who were in the war zone was 43.8%, and in refugees - 33.3%. At the same time, in women who were outside the combat zone, the incidence of PTSD was significantly lower - 16.1%.

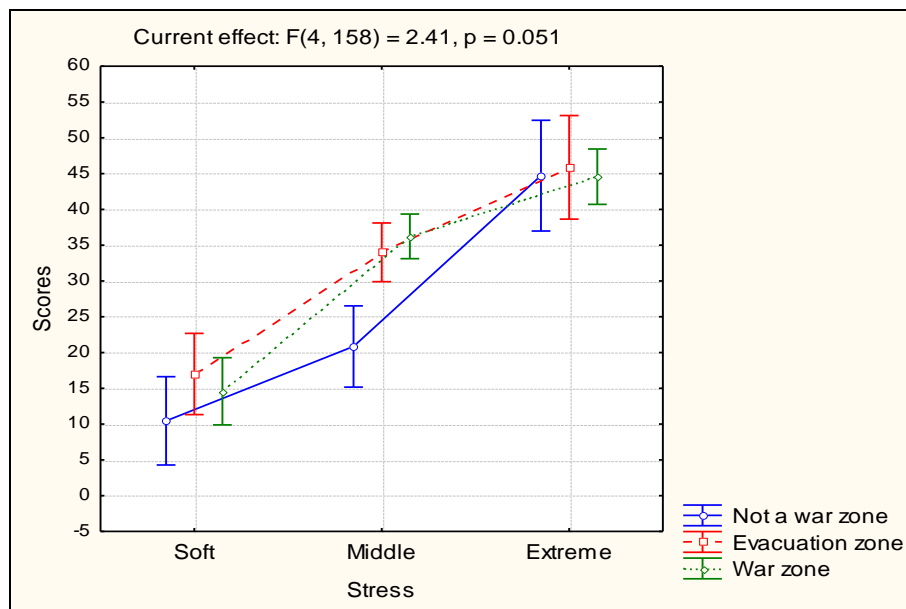
Thus, the verification of the PCL-5 scale on the Ukrainian population of people affected by the war showed that this scale adequately assesses the severity of war stress and can be used to diagnose PTSD.

Table 3

**Influence of the "Stress" factor on the total scores (Scores) according to the PCL-5 questionnaire in women who were in different zones**

Zone	Stress	N	Scores (M ± m)
Not a war zone	Soft	11	10.45 ± 1.75
	Middle	13	20.85 ± 2.44*
	Extreme	7	44.71 ± 2.60*
Evacuation zone	Soft	13	17.00 ± 2.04
	Middle	25	34.00 ± 2.44*
	Extreme	8	45.88 ± 4.00*
War zone	Soft	19	14.58 ± 2.28
	Middle	43	36.23 ± 1.74*
	Extreme	28	44.57 ± 2.02*

Note: \* -  $p < 0.05$  compared to the group "Soft stress" within each zone.



**Figure 3.** Influence of the "Stress" factor on the total scores (Scores) according to the PCL-5 questionnaire in women who were in different zones.

**Author Contributions:** All authors participated equally in writing this commentary.

**Conflicts of Interest:** The authors declare no conflict of interest.

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