



SOCIAL AND BEHAVIORAL SCIENCES. Psychology

ORIGINAL RESEARCH



Psychological Stress among University Students in Wartime: A Longitudinal Study



Authors' Contribution:

- A – Study design;
- B – Data collection;
- C – Statistical analysis;
- D – Data interpretation;
- E – Manuscript preparation;
- F – Literature search;
- G – Funds collection

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Received: 05.04.2024; Accepted: 28.06.2024; Published: 30.06.2024

Background and Aim of Study:

Abstract

War has an extremely negative effect on people's psyches. This is especially true for student youth. They have to build personal lives and continue their studies in these difficult and traumatic conditions. The aim of the study: to identify the peculiarities of the dynamics of psychological trauma, and the manifestations of depression, anxiety and stress among students in wartime.

Material and Methods:

The study involved university students from Ukraine and European Union countries in 2022-2024. Respondents aged 20-50 years were divided into 4 groups. Group 1 consisted of 107 students, including 64 (59.8%) males and 43 (40.2%) females, living in areas where there was no hostilities or shelling (November 2022). Group 2 consisted of 103 students, including 52 (50.5%) males and 51 (49.5%) females, living in the area of active hostilities (November 2022). Group 3 consisted of 112 students, including 41 (36.6%) males and 71 (63.4%) females, living in areas where there was no hostilities or shelling (March 2024). Group 4 consisted of 115 students, including 30 (26.1%) males and 85 (73.9%) females, living in the area of active hostilities (March 2024). The study involved the development of the author's questionnaire and the adapted psychological test on the DASS-21, which is available on the Google Forms platform. The technique was found to have adequate internal consistency. Cronbach's alpha was 0.807.

Results:

Longitudinal studies have shown that university students in wartime are characterised by a tendency to increase psychogenics related to martial law, communication and safety. A closer look at the dynamics of psychopathological symptoms revealed a trend towards increased depression and anxiety, as well as a stabilisation of acute stress indicators in all groups. This indicates a serious deterioration in the mental health of the students and a further chronicisation of their neurotic disorders.

Conclusions:

The negative impact of the war in Ukraine on the mental health of student youth requires the active implementation of psychological support measures and psychoprophylaxis in accordance with individual psychodiagnostic findings.

Keywords:

mental health, psychotraumatic impact, anxiety, depression, stress, students, war

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DOI:

<https://doi.org/10.26697/ijasa.2024.1.6>

Conflict of interests:

The authors declare that there is no conflict of interests

Peer review:

Double-blind review

Source of support:

This research did not receive any outside funding or support



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Introduction

More than two years of war have changed the lives of Ukrainians. Living in difficult socioeconomic and psychological conditions of war leads to psychological trauma and mental health problems. Recent psychological studies have shown that the vast majority of the population (75.0%), including 92.5% of men and 57.5% of women, are in a state of moderate to severe stress during the full-scale war in Ukraine. The intensity of general stress for men and women does not differ significantly and is in the zone of marked tension (Kurova, 2022).

University students are no exception. Today's young people face new challenges: worrying about their own safety and the safety of others, studying under martial law (underground adapted premises, online learning, disruption of timetables and quality of teaching during rocket attacks), electricity, heating and water cuts, lack of internet and mobile communications, etc. Despite the inhumane conditions, some students continue to study and live in frontline areas. Other students try to stay away from the war. They live in places where there are no active hostilities. Current research shows that students' adaptation to stress in the context of prolonged war is characterised by a certain complexity, stages, duration, nature and purposefulness (Stadnik et al., 2022). This is why we believe that longitudinal studies need more attention. This allows us to identify certain features of the psychological dynamics of the personality of students in conditions of war and prolonged insecurity.

The aim of the study. To identify the peculiarities of the psycho-traumatic effects of the war in Ukraine on university students in 2022-2024, and to describe the dynamics of their depression, anxiety and stress to develop further psychological support and psychoprophylaxis.

Materials and Methods

Two phases of the study have been conducted: November 2022 (Phase 1) and March 2024 (Phase 2) during the war in Ukraine. The survey respondents were students from Ukraine and European Union countries. The respondents were aged between 20 and 50 years.

All respondents were divided into 4 groups.

Group 1 – students living in areas where there was no hostilities or shelling (the Transcarpathian region of Ukraine and EU countries) consisted of 107 people, including 64 (59.8%) males and 43 (40.2%) females (November 2022).

Group 2 – students living in the area of active hostilities (Kharkiv region, Ukraine) consisted of 103 people, including 52 (50.5%) males and 51 (49.5%) females (November 2022).

Group 3 – students living in areas where there was no hostilities or shelling (the Transcarpathian region of Ukraine and EU countries) consisted of 112 people, including 41 (36.6%) males and 71 (63.4%) females (March 2024).

Group 4 – students living in the area of active hostilities (Kharkiv region, Ukraine) consisted of 115 people, including 30 (26.1%) males and 85 (73.9%) females (March 2024).

Due to the war in Ukraine, the study was conducted by posting the author's questionnaire and the DASS-21 psychological test on the Google Forms platform for potential participants <https://forms.gle/1JXiLsLraBKnzAcW9>. In addition, all groups were monitored during remote and face-to-face teaching. Individual interviews were conducted when necessary.

To investigate the extent and nature of the psychological trauma experienced by university students in the context of war and martial law, we used a questionnaire developed in collaboration with the Scientific Research



Institute <https://forms.gle/sAaDRx4zcYF1inSz9>. KRPOCH
 The questionnaire is anonymous and consists of 14 questions relating to place of study, gender, age, region of residence and factors of psychological trauma in the war.

Data on stress levels and content were collected using the Depression Anxiety Stress Scales (DASS-21). The DASS-21 (21 items) is a short form of the DASS-42, a self-report scale designed to measure the negative emotional states of depression, anxiety and stress. The depression/anxiety/stress scales were scored according to the methodology (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). This technique is suitable for both clinical and nonclinical settings. For Ukrainian students, the Ukrainian version of the DASS-21 questionnaire was used (Melnyk & Stadnik, 2023). The number of students with normal, minor, moderate, severe or very severe manifestations was assessed. On the depression/anxiety/stress scales, the scores were as follows: normal manifestations (0-3/0-4/0-7 points),

minor manifestations (5-6/4-5/8-9 points), moderate manifestations (7-10/6-7/10-12 points), severe manifestations (11-13/8-9/13-16 points), and extremely severe manifestations (14+/10+/17+ points). The average score on the scales is calculated as an arithmetic mean.

SPSS 29.0.2 software was used for the statistical analysis. The data were analysed by means of descriptive statistics. The internal consistency was assessed by means of Cronbach's alpha.

Results

This research is part of a comprehensive study of mental health in the extreme conditions of martial law and full-scale war in Ukraine, which has been ongoing since February 2022.

The dynamics of the level and type of psychological trauma experienced by university students during the war are shown in Table 1.

Figure 1 shows the dynamics of the overall level of psychological trauma by groups of students in wartime.

Table 1

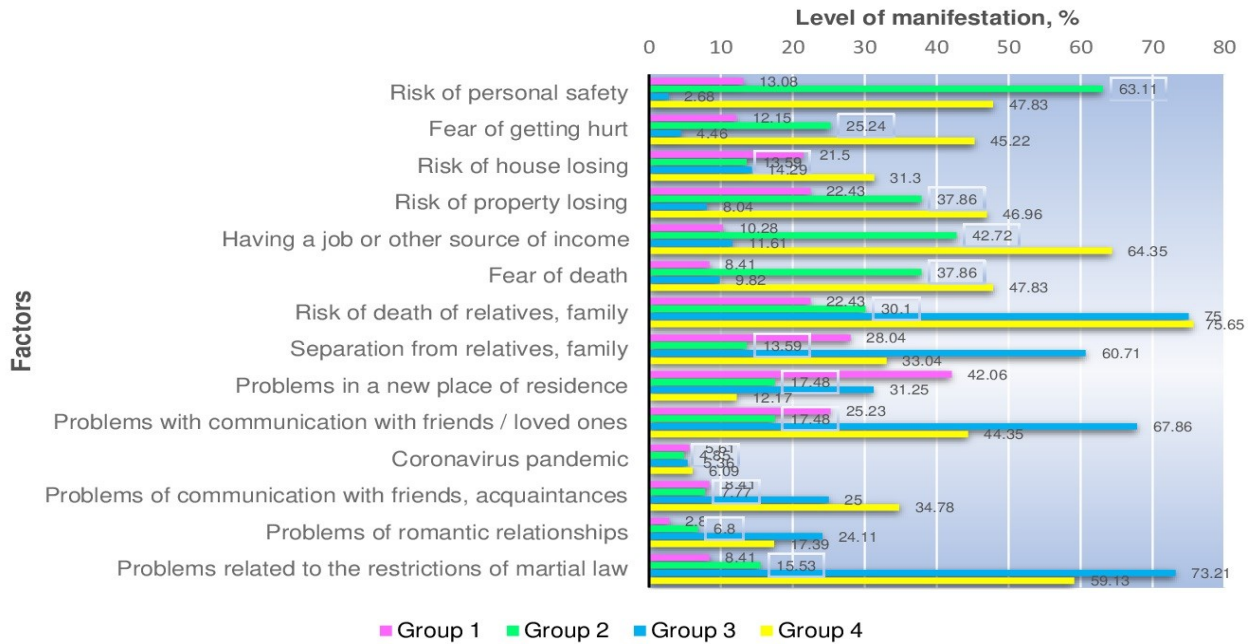
Dynamics of the Level and Type of Psychological Trauma of University Students in the Conditions of War in 2022-2024

Factors	Group 1, %			Group 2, %			Group 3, %			Group 4, %		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Risk of personal safety	13.1	9.4	18.6	63.1	50.0	76.5	2.7	0.0	4.2	47.8	30.0	54.1
Fear of getting hurt	12.2	10.9	14.0	25.2	34.6	15.7	4.5	2.4	5.6	45.2	36.7	48.2
Risk of house losing	21.5	17.2	27.9	13.6	11.5	15.7	14.3	12.2	15.5	31.3	26.7	32.9
Risk of property losing	22.4	18.8	27.9	37.9	40.4	35.3	8.0	7.3	8.5	47.0	46.7	47.1
Having a job or other source of income	10.3	10.9	9.3	42.7	75.0	9.8	11.6	9.8	12.7	64.4	76.7	60.0
Fear of death	8.4	4.7	14.0	37.9	32.7	43.1	9.8	9.8	9.9	47.8	33.3	52.9
Risk of death of relatives, family	22.4	20.3	25.6	30.1	26.9	33.3	75.0	61.0	83.1	75.7	30.0	91.8
Separation from relatives, family	28.0	18.8	41.9	13.6	9.6	17.7	60.7	85.4	46.5	33.0	56.7	24.7
Problems in a new place of residence	42.1	43.8	39.5	17.5	23.1	11.8	31.3	29.3	32.4	12.2	20.0	9.4
Problems with communication with friends / loved ones	25.2	23.4	27.9	17.5	15.4	19.6	67.9	61.0	71.8	44.4	36.7	47.1
Coronavirus pandemic	5.6	4.7	7.0	4.9	3.9	5.9	5.4	4.9	5.6	6.1	3.3	7.1
Problems of communication with friends, relatives	8.4	7.8	9.3	7.8	9.6	5.9	25.0	22.0	26.8	34.8	36.7	34.1
Problems of romantic relationships	2.8	3.1	2.3	6.8	9.6	3.9	24.1	24.4	23.9	17.4	26.7	14.1
Problems associated with restricting martial law	8.4	9.4	7.0	15.5	17.3	13.7	73.2	87.8	64.8	59.1	56.7	60.0



Figure 1

Dynamics of the Total Level of Psychological Trauma by Groups of Students in Wartime in 2022-2024



Based on the results of the online survey, for Group 1 in 2022, the main factors of psychological trauma were problems adapting to a new place of residence (42.1%), separation from relatives and family (28.0%) and problems communicating with friends/relatives (25.2%). They were least concerned about romantic relationships (2.8%), the coronavirus pandemic (5.6%), fear of death (8.4%), problems communicating with friends/relatives (8.4%) and problems related to martial law (8.4%).

At the same time, in 2024 (Group 3), the following psychogenic factors came to the fore: risk of death of relatives/family (75.0%), problems related to martial law (73.2%), problems in communicating with friends/relatives (67.9%) and separation from relatives/family (60.7%). The following factors of psychological trauma had the lowest rates: risk of personal safety (2.7%), fear of injury (4.5%), and risk of loss of property (8.0%).

It should be noted that between 2022 and 2024, we recorded a more than threefold decrease in the following psychogenes: risk of personal safety, fear of injury and risk of property loss. This indicates that these problems are being addressed among this group of students. At the same time, there has been a sharp increase in problems with romantic relationships, problems related to martial law (more than eight times), problems communicating with friends/relatives and the risk of death of relatives/family (more than three times).

Gender-specific characteristics of students living in the Transcarpathian region of Ukraine and EU countries include a significant excess (two times) of psychogenic factors such as separation from relatives/family among males and personal safety risk among females.

For respondents in Group 2 in 2022, the most important vital indicators of psychological trauma were risk of personal safety (61.9%), lack of work or other sources

of income (37.1%), fear of death and risk of losing property (37.9%). This is due to difficult military and humanitarian situations (daily rocket attacks, frequent displacement, power, water and heat cuts).

At the same time, in 2024, the trends among Group 4 students changed slightly. The main psychogenes were the risk of death of relatives/family (75.7%), lack of work or other sources of income (64.4%) and problems related to martial law (59.1%). This can be explained by the further deterioration of the socio-psychological situation due to the prolongation of the war and the significant damage to civilian infrastructure. The coronavirus pandemic (6.1%) and problems at the new place of residence (12.2%) were the least common traumatic factors for students in Group 4.

It should be noted that in 2022-2024, we recorded a significant increase (more than three times) in the following psychogenes among university students in the Kharkiv region: problems with communication with friends/relatives, problems related to martial law, and problems in romantic relationships (more than twice). There has also been an increase in the following psychological traumas: risk of losing housing, risk of death of relatives and problems communicating with friends and family. In our view, this is due to unresolved mobilisation issues, frequent rocket and drone attacks on frontline areas, intensified enemy information and psychological operations, and the escalation of the situation on the frontline. At the same time, the risk to personal safety is reduced by 1/3. This can be explained by a certain adaptation of the students to the conditions of the frontline region during this period.

Gender peculiarities of students in the Kharkiv region in 2022-2024 include a significant excess (more than two times) of the following psychogenes among men: problems in romantic relationships, problems in a new place of residence, separation from relatives/family, and



for women – risk to personal safety, fear of death, risk of death of relatives/family. The symptoms of psychological trauma were further evaluated using the DASS-21.

The comparative characteristics of depression, anxiety and stress manifestations by respondent group in 2022-2024 are shown in Table 2-4.

Table 2
 Comparative Characteristics of Depression Manifestations by Respondent Group in 2022-2024

Depression manifestations	Group 1						Group 2					
	Total		Male		Female		Total		Male		Female	
	people	%	people	%	people	%	people	%	people	%	people	%
Normal	93	86.9	58	90.6	35	81.4	81	78.6	44	84.6	37	72.5
Minor	7	6.5	3	4.7	4	9.3	10	9.7	4	7.7	6	11.8
Moderate	4	3.7	2	3.1	2	4.7	6	5.8	2	3.8	4	7.8
Severe	2	1.9	1	1.6	1	2.3	4	3.9	1	1.9	3	5.9
Extremely severe	1	0.9	0	0.0	1	2.3	2	1.9	1	1.9	1	2.0
Mean score	2.7		2.4		3.0		3.2		2.8		3.5	
-	Group 3						Group 4					
Normal	52	46.4	21	51.2	31	43.7	29	25.2	10	33.3	19	22.4
Minor	17	15.2	7	17.1	10	14.1	5	4.3	2	6.7	3	3.5
Moderate	27	24.1	8	19.5	19	26.8	46	40.0	11	36.7	35	41.2
Severe	11	9.8	3	7.3	8	11.3	24	20.9	5	16.7	19	22.4
Extremely severe	5	4.5	2	4.9	3	4.2	11	9.6	2	6.7	9	10.6
Mean score	5.1		4.7		5.3		7.2		6.3		7.5	

Table 3
 Comparative Characteristics of Anxiety Manifestations by Respondent Group in 2022-2024

Anxiety manifestations	Group 1						Group 2					
	Total		Male		Female		Total		Male		Female	
	people	%	people	%	people	%	people	%	people	%	people	%
Normal	93	86.9	60	93.8	33	76.7	78	75.7	44	84.6	34	66.7
Minor	7	6.5	2	3.1	5	11.6	11	10.7	4	7.7	7	13.7
Moderate	4	3.7	1	1.6	3	7.0	7	6.8	2	3.8	5	9.8
Severe	2	1.9	1	1.6	1	2.3	4	3.9	1	1.9	3	5.9
Extremely severe	1	0.9	0	0.0	1	2.3	3	2.9	1	1.9	2	3.9
Mean score	2.5		2.2		2.8		3.0		2.6		3.3	
-	Group 3						Group 4					
Normal	59	52.7	23	56.1	36	50.7	40	34.8	14	46.7	31	36.5
Minor	16	14.3	6	14.6	10	14.1	23	20.0	6	20.0	17	20.0
Moderate	25	22.3	9	22.0	16	22.5	28	24.3	6	20.0	22	25.9
Severe	9	8.0	2	4.9	7	9.9	14	12.2	3	10.0	11	12.9
Extremely severe	3	2.7	1	2.4	2	2.8	10	8.7	1	3.3	4	4.7
Mean score	3.9		3.7		4.0		4.8		4.1		4.6	

Table 4
 Comparative Characteristics of Stress Manifestations by Respondent Group in 2022-2024

Stress manifestations	Group 1						Group 2					
	Total		Male		Female		Total		Male		Female	
	people	%	people	%	people	%	people	%	people	%	people	%
Normal	92	86.0	52	81.3	40	93.0	80	77.7	37	71.2	43	84.3
Minor	9	8.4	7	10.9	2	4.7	12	11.7	8	15.4	4	7.8
Moderate	4	3.7	3	4.7	1	2.3	6	5.8	4	7.7	2	3.9
Severe	1	0.9	1	1.6	0	0.0	3	2.9	2	3.8	1	2.0
Extremely severe	1	0.9	1	1.6	0	0.0	2	1.9	1	1.9	1	2.0
Mean score	4.8		5.1		4.4		5.5		5.8		5.1	
-	Group 3						Group 4					
Normal	94	83.9	33	80.5	61	85.9	81	70.4	17	56.7	64	75.3
Minor	11	9.8	5	12.2	6	8.5	21	18.3	7	23.3	14	16.5
Moderate	5	4.5	1	2.4	4	5.6	8	7.0	4	13.3	4	4.7
Severe	1	0.9	1	2.4	0	0.0	3	2.6	1	3.3	2	2.4
Extremely severe	1	0.9	1	2.4	0	0.0	2	1.7	1	3.3	1	1.2
Mean score	4.9		5.2		4.7		5.7		6.7		5.4	



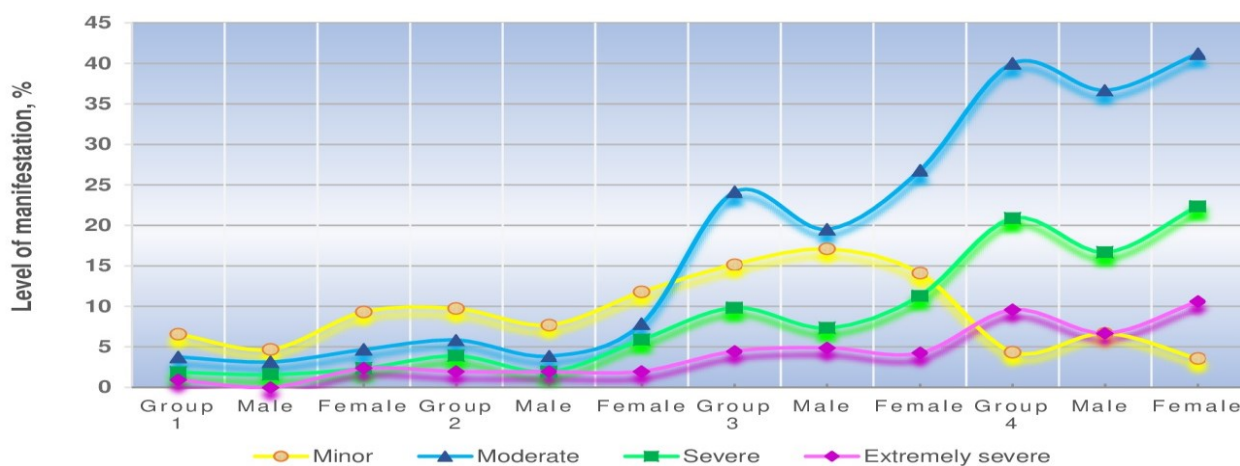
The dynamics of minor, moderate, severe and extremely severe depression manifestations among university students during the war are shown in Figure 2.

The dynamics of the Depression Scale revealed an almost 2-fold decrease in the absence of depressive symptoms among students in the Transcarpathian region and the EU in 2022-2024 (from 86.9% of students in Group 1 to 46.4% of students in Group 3). The scores

for minor (15.2%), moderate (24.1%), severe (9.8%) and extremely severe (9.8%) manifestations of depression among Group 3 students in 2024 increased more than 2-fold. This indicates a serious deterioration in their mental health. This was usually manifested by complaints of frequent headaches, stomach pain, rapid heartbeats or breathing, sweating, dizziness and unexplained panic.

Figure 2

Dynamics of Depression Manifestations among University Students in Wartime in 2022-2024



The gender specificity of students is that depression is more pronounced among women in Group 3 than among all groups of students studying in the Transcarpathian region and in the EU. The scores of moderate (26.8%), severe (11.3%) and extremely severe (4.2%) manifestations of depression among women in 2024 increased more than 2-fold compared to the same data in 2022 (4.7%, 2.3% and 2.3% respectively) and more than that among men in Group 3 (19.5% and 7.3% respectively).

The dynamics of the Depression Scale among students in the Kharkiv region (Groups 2 and 4) were revealed as follows. Over the period 2022-2024, there was a decrease (more than 3-fold) in the absence of depressive symptoms from 78.6% (students in Group 2) to 22.4% (students in Group 4). The scores for moderate (40.0%), severe (20.9) and extremely severe (9.6%) manifestations of depression among students in Group 4 in 2024 increased more than 5-fold. These scores are the highest of all the groups studied. This indicates a significant deterioration in the mental health of students in the Kharkiv region in 2022-2024.

The gender differences in depression manifestations among students in the Kharkiv region are the greatest among women in Group 4 (2024). This suggests that these women have significant mental health problems. In 2024, the percentages of women with moderate (26.7%), severe (11.3%), and extremely severe (4.2%) depression increased more than 2-fold compared to those in 2022 (4.7%, 2.3% and 2.3% respectively). Men in Group 4 had lower levels of depression than women did. Minor (6.7%), moderate (36.7%), severe (16.7%)

and extremely severe (6.7%) manifestations of depression were less common among men in Group 4 than among women (3.5%, 41.2%, 22.4% and 10.6% respectively).

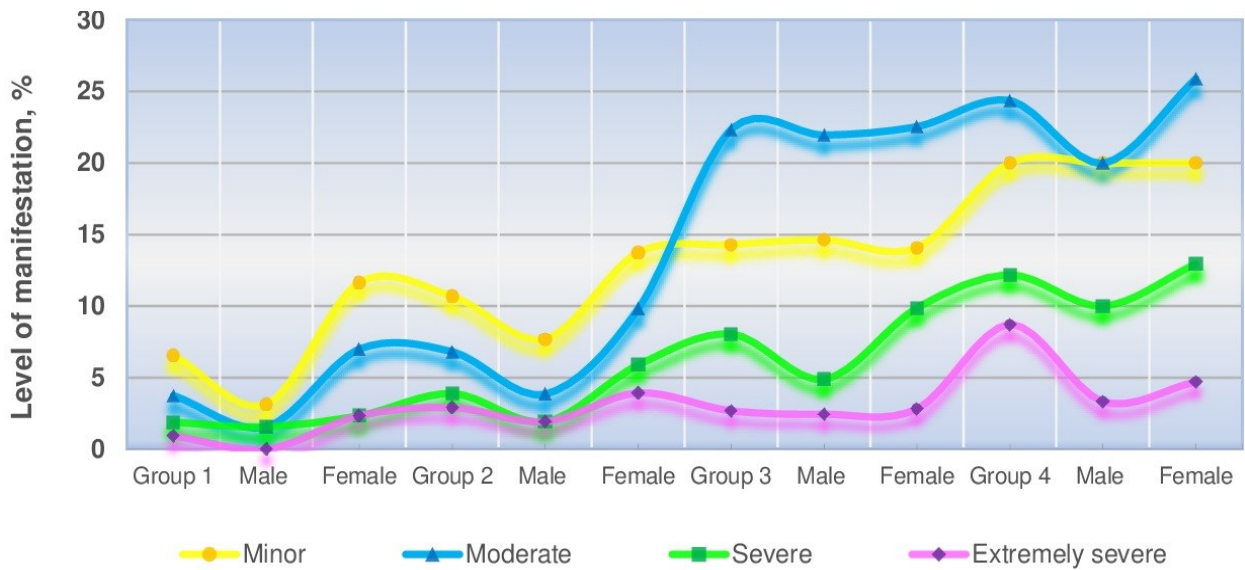
The dynamics of minor, moderate, severe and extremely severe anxiety manifestations among university students during the war are shown in Figure 3.

We analysed the dynamics of the Anxiety Scale score based on a study of students using the DASS-21. Among students living in the Transcarpathian region and the EU in 2022, 86.9% had no anxiety symptoms (normal manifestations), 6.5% had minor symptoms, 3.7% had moderate symptoms, 1.9% had severe symptoms, and 0.9% had critical anxiety. In 2024, 52.7% of the students had no anxiety symptoms (normal manifestations), 14.3% had minor symptoms, 3.7% had moderate symptoms, 8.0% had severe symptoms, and 2.7% had extremely severe anxiety. The increase in particularly severe and extremely severe manifestations of anxiety among students indicates a sharp deterioration in their psychological state, the presence of neurotic disorders and maladjustment in the third year of the war.

It should be noted that, according to the results of the 2022 gender survey, anxiety is more pronounced among women. Minor anxiety symptoms were observed in 11.6% of women, moderate in 7.0%, severe and extremely severe in 2.3%, these percentages were significantly greater than those for men (3.1%, 1.6%, 1.6% and 0.0%, respectively). In 2024, there is no statistically significant difference between the anxiety scores of women and men in the Transcarpathian region and the EU.



Figure 3
 Dynamics of Anxiety Manifestations among University Students in Wartime in 2022-2024



The dynamics of the Anxiety Scale among students in the Kharkiv region showed that moderate (24.4%), severe (12.2%) and extremely severe (8.7%) manifestations of anxiety among students in Group 4 in 2024 increased more than 3 times and were the highest among all study groups. This indicates a significant deterioration in the mental health of the students, manifested by complaints of palpitations, pain behind the breastbone, rapid breathing, excessive sweating, trembling, weakness, fatigue, dizziness, frequent urination and sleep problems. Among all gender groups in the Kharkiv region, anxiety is most pronounced among women in Group 4 (2024),

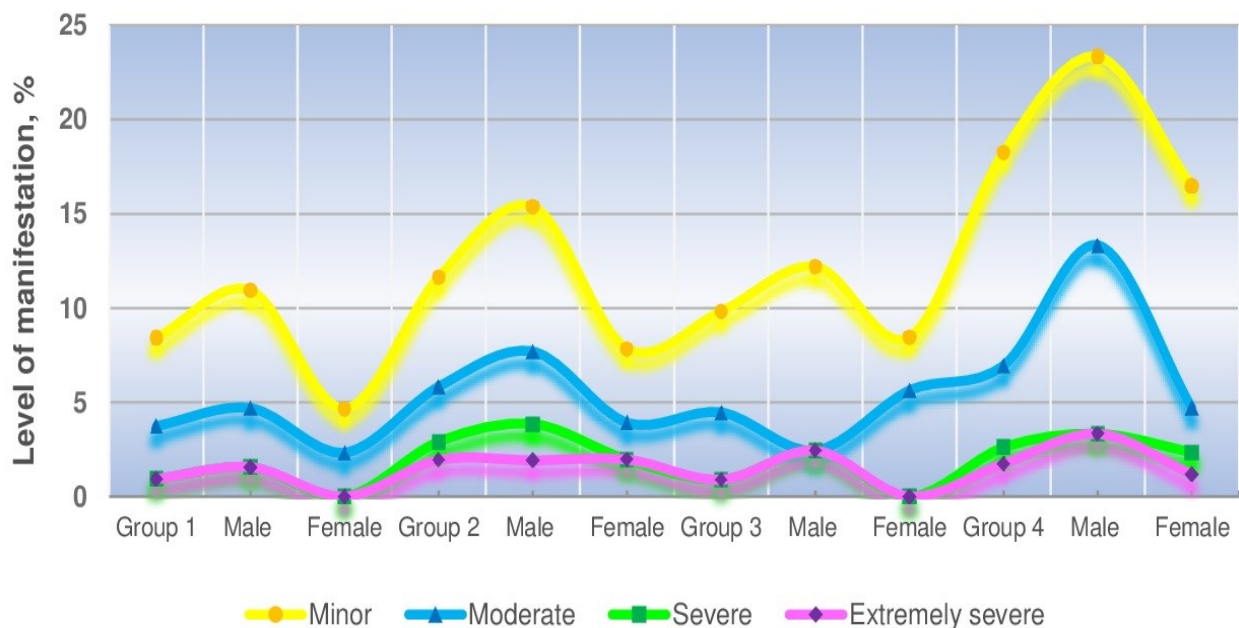
indicating significant mental disorders among these respondents.

The scores of moderate (25.9%), severe (12.9%) and extremely severe (4.7%) anxiety among women in 2024 increased by 1.5-2 times compared to those in 2022 (9.8%, 5.9% and 3.9% respectively).

The anxiety scores of the men in Group 4 (20.0%, 10.0% and 3.3%, respectively) were also lower than those of the women.

The dynamics of minor, moderate, severe and extremely severe stress manifestations among university students during the war are shown in Figure 4.

Figure 4
 Dynamics of Stress Manifestations among University Students in Wartime in 2022-2024



The dynamics of the Stress Scale among students in the Transcarpathian region and the EU (Groups 1 and 3) are as follows. In 2022, 8.4% of the students experienced

minor manifestations of stress; 1.7% experienced moderate manifestations; 0.9% of the students in Group 1 had severe and extremely severe manifestations. In



2024, 9.8% of students experienced minor manifestations of stress; 4.5% experienced moderate manifestations; 0.9% of the students in Group 3 experienced severe or extremely severe manifestations. The lack of dynamics indicates a certain stabilisation of acute stress among students in the Transcarpathian region and the EU during the war.

The gender peculiarities of stress manifestations among students in the Transcarpathian region and the EU are that moderate, severe and extremely severe manifestations were observed in 2.4% of the students, which is greater than the same percentages among women (5.6%, 0.0% and 0.0%, respectively). This indicates that male students are less able to adapt to stress.

By analysing the dynamics of the Stress Scale among students in the Kharkiv region (Group 2 and Group 4), we noted a slight increase in minor (18.3%) and moderate (7.0%) manifestations of stress in 2024. At the same time, the scores of severe and extremely severe

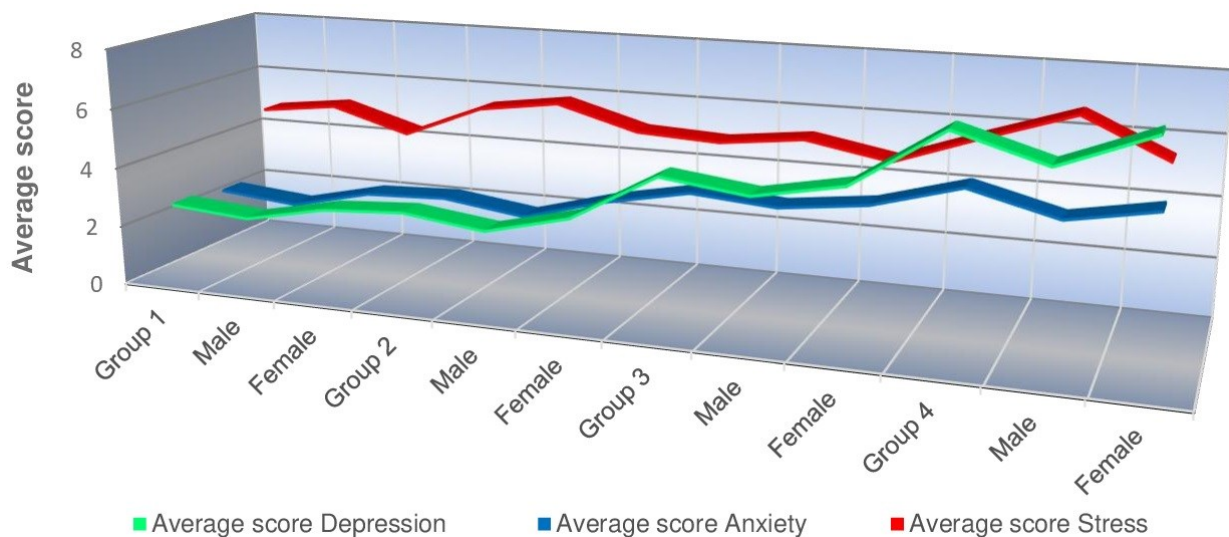
stress among students in the Kharkiv region remained virtually unchanged in 2022-2024, indicating an insufficient level of adaptation to stress among students in the third year of the war.

Gender differences among students studying in the Kharkiv region are that among all gender groups, stress is most pronounced among males in Group 4 (2024). This indicates significant psychological disturbance in these respondents, manifested by heart palpitations, breathing difficulties and insomnia. Male students were more likely to have diarrhoea (or, conversely, constipation), acute respiratory diseases, skin diseases (neurodermatitis), allergies, tremors and sticky hands. The scores of men with minor (23.3%), moderate (13.3%), severe (3.3%) and extremely severe (3.3%) stress in 2024 are significantly greater than those of women (16.5%, 4.7%, 2.4% and 1.2% respectively).

The dynamics of the total manifestations of depression, anxiety and stress among university students during the war are shown in Figure 5.

Figure 5

Dynamics of Total Manifestations of Depression, Anxiety and Stress among University Students in Wartime



During the 2022-2024 war in Ukraine, we observed the following changes in the psychological well-being of university students.

The average scores on the Depression Scale for students in Groups 1 and 2 (2022) were 2.7 and 3.2 points respectively, which are more than twice as high as those for students in Group 3 (5.1 points) and Group 4 (7.2 points) in 2024. This upwards trend in depression indicates a certain tendency toward chronic neurotic disorders among university students against the background of the protracted war in Ukraine, which manifests itself in increased complaints of low mood, low self-esteem, pessimism, apathy, lethargy, fatigue, constant dissatisfaction and hopelessness. In terms of gender differences in the Depression Scale, the average score of female students was greater than that of male students in all study groups.

We also see an upwards trend on the Anxiety Scale. The average scores for students in Group 3 and Group 4 in 2024 were 3.9 and 4.8 points, respectively, which are

significantly greater than those in 2022 for Group 1 (2.5 points) and Group 2 (3.0 points). We believe this is due to the continued uncertainty of the military and humanitarian situation in Ukraine as a result of the war. This took the form of increased helplessness, insecurity, powerlessness, powerlessness, insecurity, loneliness, a sense of failure and an inability to make decisions. It should be noted that the average score on the Anxiety Scale for female students was greater than that for male students in all study groups.

The average scores on the Stress Scale for students in Groups 1 and 3 living in the Transcarpathian region and the EU remained virtually unchanged over the period 2022-2024 (4.8 and 4.9 points respectively) and were lower than those for students in Groups 2 and 4 living in the Kharkiv region (5.5 and 5.7 points respectively). This indicates a much worse military and humanitarian situation in the Kharkiv region, which is close to the front line, as well as a certain adaptation of students to acute psychogenic conditions in the context of the 2022-2024



war. It should be noted that the average score of the male students on the Stress Scale was greater than that of the female students in all study groups.

Cronbach's alpha coefficients were calculated for each of the three scales of the DASS-21 as an estimate of internal consistency reliability. Acceptable levels of reliability were found for all scales: Depression scale $\alpha=0.712$, Anxiety scale $\alpha=0.783$, Stress scale $\alpha=0.733$. Cronbach's alpha for the total scale was $\alpha=0.807$. These scores are an indication of the homogeneity of the items in each dimension of the scale.

Discussion

Since the end of the Second World War, Europe has not seen a war of scale and intensity that is currently taking place in Ukraine. This war has affected the lives of more than 40 million Ukrainians, including hundreds of thousands of students.

Most students continue their studies at university. Some students (a small number, mostly women) have been forced to become refugees and continue their studies remotely in EU countries. It must be borne in mind that in the globalised modern world, the effects of a war in one country will inevitably have repercussions in other countries. War affects international politics, economics, population migration, health care, etc., to varying degrees.

This study is an integral part of a longitudinal study that includes a comprehensive examination of the mental health of Ukrainian students continuing their studies under extreme conditions: low-intensity war (2014-2022), the COVID-19 pandemic (2020-2022), and martial law and full-scale war in Ukraine (from 2022 to the present). This study explored stressors that may affect the academic performance and well-being of young people in a military environment. Such risk factors include mental, emotional and behavioural problems.

For a specific study, the dynamics of depression, anxiety and stress indicators were examined among students at state universities in Ukraine who studied in 2022-2024 in significantly different regions. The study also included students who continued their studies at a distance in EU countries. This choice was necessitated by the need to study the effects of warfare on students under different conditions of stress: Group 1 (students living in areas where there was no hostilities or shelling, Transcarpathian region of Ukraine and EU countries, November 2022); Group 2 (students living in the area of active hostilities, Kharkiv region, Ukraine, November 2022); Group 3 (students living in areas where there was no hostilities or shelling, Transcarpathian region of Ukraine and EU countries, March 2024); and Group 4 (students living in the area of active hostilities, Kharkiv region, Ukraine, March 2024).

Recent scientific publications in the social and behavioural sciences, as well as the authors' own experience, allowed us to build the methodological basis for our research.

Previous studies have examined the effects of extreme conditions of low-intensity warfare on military personnel (Melnyk et al., 2019). The level of resistance of soldiers

to combat psychological trauma depends on the impact of extreme conditions (participation in combat operations). Even with a low level of exposure to extreme conditions (lack of combat experience), there is a high probability of mental disorders, a tendency toward personality disorders, and behavioural and activity disorders.

The COVID-19 pandemic has added extreme conditions to the existing conditions of low-intensity warfare in our study of the mental health of military personnel and students. These new conditions made it possible to determine that military men with combat experience were significantly less likely to suffer from anxiety, depression, stress and sleep disorders than military men without such experience (Melnyk et al., 2020; Melnyk & Stadnik, 2020). We assumed that the mental health of students in low-intensity wars and under extreme pandemic conditions would be significantly different from the mental health of trained military personnel. Therefore, we only looked at students who were involved in sports. Most students had a moderate level of mental health, approximately one-third had a high level of mental health, and less than 10.0% had a low level of mental health (Melnyk et al., 2022). Similar findings of the positive impact of physical activity and sport on respondents' mental health during this period have been reported by other researchers (Lange et al., 2023; Watson et al., 2023). These studies confirm that systematic physical activity has a positive effect on mental health, even in the extreme conditions of a pandemic and/or low-intensity war. The positive effect of physical activity on students' mental health has been demonstrated in numerous studies (Mahindru et al., 2023; Melnyk, 2019; Yao et al., 2023), including under the extreme conditions of the COVID-19 pandemic (Huang et al., 2023; Precht et al., 2023).

Studies of student youth in a full-scale war show that the greatest psychogenics are: risk of death of relatives, family separation from relatives, family, lack of work or other source of income, fear of death and risk of loss of property (Stadnik et al., 2022).

There is also a link between psychological distress and chronic fatigue and sleep problems. This relationship is bidirectional, as symptoms can be both a source and a consequence of psychological distress. In addition, the dependence of the mental state of the students on the degree of their physical proximity to the combat zone was revealed. The negative impact on students' mental health increases with proximity to the combat zone (Stadnik et al., 2023). The analysis of the psychological well-being of university students and their choice of coping strategies to overcome life crises in the context of the war in Ukraine shows that the level of negative impact was greater the closer the students were to the zone of active hostilities. University students use different coping strategies in stressful war situations in Ukraine. However, the coping strategy of cognitive restructuring is more commonly used. Coping strategies of social support and self-criticism are typical for students living in the area of active military operations (Pypenko et al., 2023).



Personal resources that might support the resilience of a sample of Ukrainian students to the stress of war were explored. Emotional stability and resilience were found to be the resources most strongly associated with fewer posttraumatic stress disorder symptoms and fewer physical complaints, while benevolence and integrity also played a role (Kokun & Bezverkhyi, 2024).

The problems of Ukrainian refugee students pursuing higher education in Europe have been studied by Pentón Herrera and Byndas (2023), and Regnoli et al. (2023). Refugees have been found to experience psychological stress that can lead to mental health problems. War-related population movements have a negative impact on mental health, which is regularly confirmed by numerous studies (Fino et al., 2020; Radhouane, 2023).

The unprecedented scale of Russian aggression against Ukraine has caused the largest mass displacement of people in modern history (Patel & Erickson, 2022). Studies show that asylum seekers and refugees are particularly vulnerable to traumatic experiences that are threefold in nature: pre-migration, peri-migration, and post-migration (Chen et al., 2017). According to researchers (Marchi et al., 2022), the experience of war and displacement can have profound effects on children's affective development and mental health. However, the mechanisms underlying these effects remain unknown.

In addition, refugees are exposed to war through the media coverage of war-related violence. This leads to stress and overstimulation (Chudzicka-Czupala et al., 2023).

The relevance of certain psychological symptoms (anxiety, depression, insomnia, and poor health) among civilians and especially young people during war is widely recognised (Baroud & Dirani, 2023; Zaid et al., 2023).

Contemporary research during the Russian-Ukrainian War has shown high prevalence rates of symptoms of psychological distress, anxiety, depression and insomnia among Ukrainians aged 18 and over. In addition, researchers stress the need for further research and the need to develop effective survival strategies for Ukrainians during the war (Długosz, 2023; Khraban, 2022; Pavlova & Rogowska, 2023).

The choice of the subject of research and techniques was determined by the real needs and problems identified in the scientific literature. The Depression Anxiety Stress Scales are widely used in modern research as a reliable screening tool for studying the impact of war on individuals' mental health (Çelebi & Durmuş Sarikahya, 2023; Chudzicka-Czupala et al., 2023; El-Ghitany et al., 2024).

The application of this technique made it possible to identify psychogenic factors affecting students in war and martial law conditions, as well as to detail psychopathological symptoms according to the Anxiety, Depression and Stress Scales.

We analysed the data from the DASS-21 study and compared it with other research techniques, namely, the General Health Questionnaire (GHQ-28), and the Social Support Questionnaire (F-SozU K-22), in the context of dividing students into groups according to the level of

influence of their proximity to the combat zone. Similar results have been found in a number of studies: manifestations of depression were more common in women than in men. At the same time, severe and extremely severe manifestations of anxiety (2-3 times higher than similar indicators in respondents) were observed among students who were not in the vicinity of the combat zone (Stadnik et al., 2022; 2023). There was evidence of a strong dose-response relationship between war-related stressors and meeting criteria for posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD). Participants who had the highest exposure to war-related stressors were significantly more likely to meet the requirements for PTSD (OR=4.20; 95% CI=2.96-5.95) and CPTSD (OR=8.12; 95% CI=5.11-12.91) compared to the least exposed (Karatzias et al., 2023).

Similar trends, albeit at slightly different rates, have been reported by other researchers. People living in a war-torn region of Ukraine also had a significantly increased risk of PTSD (OR=4.11, 95% CI=2.37-7.13), severe anxiety (OR=3.10, 95% CI=1.83-5.27), and moderate/severe depression (OR=2.65, 95% CI=1.79-3.92) (Osokina et al., 2023).

Thus, the use of different techniques to study this problem shows similar results – the war had a significant negative impact on the mental state of students, and the closer they were to the war zone, the greater the impact.

In line with previous research on the impact of the Russian-Ukrainian War on the mental health of students' youth in Ukraine, predictors are described that determine the impact of features of interpersonal style on the index of perceived stress, index of coping resources, positive attitude towards others, autonomy, environmental management, personal development, life goals, self-perception, psychological well-being, inclusion, control, risk acceptance, and resilience (Lunov et al., 2023). Effects can also be characterised as stages of mental health impact: acute reactions – acute disorder – chronic stress/disorder at both personal and societal levels (Vus & Esterlis, 2022). Gilreath et al. (2022) studied stressors that can affect the academic performance and well-being of youth during wartime.

This study has several limitations. First, it should be noted that the study was conducted under active war conditions, which may have contributed to the high scores. Second, our study is limited by the small number of participants in each group. It was not possible to carry out a more comprehensive assessment of the students under these conditions.

It must be considered that the participants were young students. This may have influenced the results. Some researchers argue that young people are more interested in contemporary social dilemmas than other age groups, and that this affects their mental health and psychological well-being (Barchielli et al. 2022; Bezzi 2022; Galliano 2020).

It should also be noted that in the study of Ukrainian students, we used only the Ukrainian versions of the author's questionnaire and the DASS-21 questionnaire (Melnyk & Stadnik, 2023). This approach avoided any



possible misinterpretation of the questions and optimised the response time.

Nevertheless, this has provided important information that provides an insight into the mental health status of the sample and allows conclusions to be drawn about the dynamics of this process over the last two years, which can help to take early action to improve the mental health status of students.

Conclusions

In conclusion, the ongoing war in Ukraine has had a negative impact on the mental health of university students.

Our longitudinal studies conducted in 2022-2024 showed that university students in the Transcarpathian region of Ukraine and EU countries are characterised by a significant decrease (by 3 to 4 times) in the following psychogenes: risk of personal safety, fear of injury, and risk of property loss. This indicates a reduction in their role in the psychological trauma of students. At the same time, there was a significant increase in problems with romantic relationships, problems related to martial law (8 times), problems communicating with friends/relatives and the risk of death of relatives/family (3 times).

Among university students who did not change their place of permanent residence and stayed in the frontline area of the Kharkiv region in 2022-2024, we recorded a significant increase in the following psychogenes: problems communicating with friends/relatives, problems related to martial law, problems in romantic relationships (more than 3 times), the risk of losing housing, the risk of death of relatives, and problems communicating with friends/relatives (more than 2 times). In our opinion, this is due to the problems of mobilisation, frequent rocket and drone attacks on the frontline areas, the intensification of the enemy's information and psychological operations and the escalation of the situation on the frontline. At the same time, there is a decrease in the risk to personal safety (by 1/3), which can be explained by a certain adaptation of the students to the conditions of the frontline region during this period.

Gender dynamics are characterised by a significant prevalence of psychogenic factors such as separation from relatives and family (Groups 1 and 3) and problems with romantic relationships and new residences (Groups 2 and 4). For women, the greatest risks are personal safety (in the Transcarpathian region and the EU), fear of death, and the risk of death for relatives and family (in the Kharkiv region).

A more detailed study of the dynamics of psychopathological symptoms, carried out using the DASS-21 technique, showed that in 2022-2024 among students in the Transcarpathian region and the EU, the scores of minor, moderate, severe and extremely severe manifestations of depression increased more than 2-fold. Among students living in the Kharkiv region, it increased more than 5-fold and was the highest of all student groups. This indicates a serious deterioration in students' mental health and is usually manifested by frequent headaches, stomach aches, rapid heartbeat or breathing,

sweating, dizziness and occasional panic. The gender peculiarity of depression is its prevalence among women in all groups, with the highest levels of depression among women in Group 4 (Kharkiv region) in 2024.

The studied dynamics of anxiety among students showed an increase in moderate, severe and extremely severe manifestations of anxiety both among students in Group 3 (the Transcarpathian region and the EU) and among students in Group 4 (the Kharkiv region). At the same time, the anxiety scores of Group 4 students increased more than 3-fold in 2024 and were the highest of the all groups. The symptoms included palpitations, pain behind the breastbone, rapid breathing, excessive sweating, trembling, weakness, fatigue, dizziness, and frequent urination and sleep problems. Gender peculiarities: the anxiety scores of women and men in the Transcarpathian region and the EU are not significantly different, and among all gender groups, anxiety is most pronounced among women in Group 4 in 2024.

The recorded dynamics of stress among university students during the war showed a certain stabilisation and the absence of acute stress among students in the Transcarpathian region and the EU, as well as an increase in minor and moderate stress among students in the Kharkiv region. Symptoms included palpitations, difficulty breathing, insomnia, frequent diarrhoea (or, conversely, constipation), acute respiratory problems, skin problems (neurodermatitis), allergies, tremors and sticky hands. The gender specificity of stress manifestations among students is the prevalence of stress among males in all groups studied. In 2024, men in Group 4 (Kharkiv region) had the highest level of stress, indicating that these respondents had acute mental disorders.

The dynamics of general depression, anxiety and stress scores among university students during the war showed a trend towards an increase in depression and anxiety and a stabilisation of stress scores. This indicates the chronicity of neurotic disorders among students in the context of the protracted war in Ukraine. Symptoms included increasing complaints of low mood, low self-esteem, pessimism, apathy, lethargy, fatigue, constant dissatisfaction and hopelessness.

In our view, the prospect of further research lies in the development of effective measures of psychological support and psychoprophylaxis among students.

Acknowledgments

The authors would like to express their gratitude to all the participants who completed the questionnaire and all who helped us in distributing and gathering the questionnaires required for the data collection.

Ethical Approval

The study protocol was consistent with the ethical guidelines of the 1975 Declaration of Helsinki, as reflected in prior approval by the Institution's Human Research Committee. Permission for this research was received from the Research Committee of Virtue and Ethics Scientific Research Institute KRPOCH (protocol no. 023-3/SRIKRPOCH dated 10.08.2023). Informed consent was sought from all the participants.



Funding Source

This research did not receive any outside funding or support.

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Cite this article as:

Mykhaylyshyn, U. B., Stadnik, A. V., Melnyk, Yu. B., Vveinhardt, J., Oliveira, M. S., & Pypenko, I. S. (2024). Psychological stress among university students in wartime: A longitudinal study. *International Journal of Science Annals*, 7(1), 27–40. <https://doi.org/10.26697/ijisa.2024.1.6>

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