

Medical students' mental health after the first year of war in Ukraine: A cross-sectional study

Journal of Health Psychology
1–16

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DOI: 10.1177/13591053251328916

journals.sagepub.com/home/hpq



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Abstract

Ukrainian medical students face a high risk of mental health issues, including depression and anxiety, which exacerbated by the COVID-19 pandemic and the ongoing war. This study examines their mental health one year into the war, focusing on depression, anxiety, and coping strategies while identifying vulnerable groups. A cross-sectional study was conducted during 2023, involving 506 students from Bogomolets National Medical University in Kyiv and 380 from the University of Split, Croatia, as a control group. A higher proportion of Ukrainian students had a history of mental health problems (37.5%) compared to their Croatian peers, along with higher rates of depression (52.2%) and anxiety (44.8%). Key predictors including war-related stressors, financial problems, and displacement were strongly linked to depression and anxiety, though some factors had stronger associations with specific conditions. These findings highlight the war's severe mental health toll on medical students, emphasizing the need for targeted interventions.

Keywords

medical students, mental health, Ukraine, war

Introduction

Mental disorders are among the top ten causes of disease burden worldwide, according to the Global Burden of Disease (Ferrari et al., 2022), particularly affecting vulnerable groups such as women, children, the elderly, and individuals with disabilities (Murthy and Lakshminarayana, 2006). In war-affected populations, the prevalence of mental health problems is even higher. The impact of war on civilian mental health is one of its most severe consequences, making mental health a critical public health concern in

complex emergencies (Mollica et al., 2004). The ongoing Russo-Ukrainian war, which began in 2014, remains under-researched regarding its effects on Ukrainians' mental

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health and coping mechanisms. Following the full-scale Russian invasion in 2022, the need for psychological support has grown substantially (Xu et al., 2023). Despite evidence that medical students face higher mental health risks (Harvey et al., 2009), research on the impact of war on this population is limited, and very few studies have specifically examined Ukrainian medical students (Srichawla et al., 2022; Takoutsing et al., 2023).

Medical students experience significantly higher anxiety rates than the general population, with a global prevalence of 33.8% reported in a meta-analysis of 69 studies (Quek et al., 2019). Compared to their peers, they also show higher rates of depression, anxiety, burnout, and suicidal ideation (CDC NCHS, 2020; Dyrbye et al., 2014; Rotenstein et al., 2016). These issues were further exacerbated by the COVID-19 pandemic, which placed additional strain on medical students as future healthcare providers (Christophers et al., 2021; Jupina et al., 2022; Liu et al., 2020).

The Russian invasion of Ukraine has compounded these challenges for Ukrainian healthcare professionals (Fontanarosa et al., 2022; Gostin and Rubenstein, 2022). The war has devastated the healthcare system, displacing professionals and restricting access to essential care (Goniewicz et al., 2023). Atrocities, displacement, bombings, violence, and the breakdown of social networks pose severe risks to the physical and psychological well-being of affected populations, particularly those in critical developmental stages (Mollica et al., 2004). Additionally, the war has significantly disrupted medical education in Ukraine, with students and faculty facing interruptions due to facility losses, air raids, and power outages. These disruptions introduce new threats to the mental health of medical students, who were already recovering from the psychological toll of the COVID-19 crisis. Preliminary data confirm the negative psychological effects of war on students, particularly medical students, including fear, substance use, stress, loneliness, and

burnout, despite the limited existing evidence on this topic (Al Saadi et al., 2017; Kurapov et al., 2023). Research indicates that Ukrainian medical students are experiencing increased levels of depression, anxiety, and stress due to the war. After 18 months of war, a significant percentage of Ukrainian medical students self-reported signs of stress (62.5%), anxiety (59.6%), and depression (58.8%). A substantial number also showed symptoms of post-traumatic stress disorder (44.2%) (Korda et al., 2024).

This study examines the mental health of medical students after the first year of the war in Ukraine, comparing them to a control group of medical students from Croatia to differentiate the effects of war from those of COVID-19. Case-control studies are valuable for differentiating the specific effects of war from other potential stressors. By comparing a war-affected group with a control group, researchers can more accurately identify the unique mental health challenges arising from the conflict. We hypothesized that the war has significantly worsened the mental health of Ukrainian medical students compared to their unaffected counterparts. To identify particularly vulnerable students, our study assessed depression, anxiety, and coping strategies, as well as demographic and lifestyle variables and war-related stressors known to be associated with mental health issues.

Participants and methods

Study design, setting, and participants

This cross-sectional study was conducted at two medical schools: Bogomolets National Medical University, Medical Faculty No. 2 (MF2) in Kyiv, Ukraine, and the University of Split School of Medicine (USSM) in Split, Croatia. USSM students, who experienced the COVID-19 pandemic but not the war, served as a control group. Both institutions follow a structured six-year curriculum, are public, and enroll around 100 students annually. Participants were

medical students over 18 years old who provided consent to participate. No other exclusion criteria were applied. To reduce potential selection bias, we employed total population sampling, distributing the questionnaire to all eligible students enrolled from the first to sixth year. Given our aim to include the entire target population, no formal sample size calculation was required.

The online survey, conducted via SurveyMonkey between June and December 2023, was designed for mobile phone access. Administered during lectures, students were provided a QR code linking to the survey. Participants clicked the link, read the information page, and provided informed consent before starting.

The study adhered to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES; Supplemental Appendix 1; Eysenbach, 2004) and the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE; Supplemental Appendix 2; von Elm et al., 2008).

Survey instruments

The questionnaire comprised four sections (Supplemental Appendix 3). The first section gathered demographic data, including age, gender, education, relationship status, financial situation, housing, displacement, medical education, and lifestyle. Lifestyle variables covered smoking, alcohol consumption, drug use, social relationships, sexual activity, and physical exercise, with responses categorized as “yes” or “no.” These factors have been selected based on previously published results that are associating them with mental health issues (Cheah et al., 2020; Farrer et al., 2016; Lu et al., 2023; Wang et al., 2022).

The second section assessed potential traumatic events using the Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013), a 17-item self-report measure listing stressful events and five response options to indicate the nature

of exposure. Though the original LEC-5 does not produce a total score, we applied a weighted scoring method based on trauma exposure proximity (Weis et al., 2022). Directly experienced events were weighted as 3, witnessed events as 2, and learned-about events as 1, with higher scores indicating closer trauma exposure. Scores were also categorized into six groups: accidental violence, interpersonal violence, sexual violence, war-related violence, death/suffering events, and other stressful events, based on prior classifications (Dmytriiev et al., 2023).

The third section evaluated mental health using the Patient Health Questionnaire-9 (PHQ-9) for depression (Kroenke et al., 2001) and the General Anxiety Disorder-7 (GAD-7) scale for anxiety (Spitzer et al., 2006). PHQ-9 scores of 5, 10, and 15 correspond to mild, moderate, and severe depression, respectively, while GAD-7 uses the same thresholds for anxiety, with both scales establishing a score of 10 or higher as the cut-off value based on the original scoring methods (Kroenke et al., 2001; Spitzer et al., 2006).

The final section used the Brief Resilient Coping Scale (BRCS) to assess stress-coping abilities (Sinclair and Wallston, 2004). This scale includes four statements rated from 1 (“Does not describe me at all”) to 5 (“Describes me very well”), with higher scores (17–20) indicating high resilience and lower scores (4–13) suggesting lower resilience.

All these tools have been validated in Ukrainian (Dmytriiev et al., 2023; Weigelt and Kizilhan, 2024) and endorsed by the International Trauma Consortium (ITC) initiative We Stand With Ukraine (Shevlin et al., 2022). The GAD-7 and PHQ-9 scales have also been validated in Croatian (Milić et al., 2024) and are widely used in mental health studies, including those related to the COVID-19 pandemic (Pfizer, 2025; Vidović et al., 2024). Upon completing the survey, participants were provided with information on available crisis services at both universities to support those experiencing distress.

Ethics

The study received ethical approval from the Ethics Committee at Bogomolets National Medical University (protocol No. 172, 22 May 2023) and the Ethics Committee of USSM (protocol No. 003-08/23-03/0015). It adhered to the ethical principles of the Declaration of Helsinki and the European Union's General Data Protection Regulation (GDPR). Participants were fully informed about the study's nature, purpose, and procedures. Informed consent was obtained on the first page of the anonymous online survey. Participation was voluntary, with no incentives or coercion, and participants could withdraw at any time without consequences.

Statistics

Continuous variables were summarized as means and standard deviations (SD), while categorical variables were presented as percentages. Bivariate analyses compared MF2 and USSM students on sociodemographic characteristics, health, and stressful life events using Student's *t*-tests and Chi-square tests. For significant Chi-square results, post hoc analysis calculated standardized residuals, with values exceeding an absolute value of 2 deemed significant.

Binomial logistic regression, yielding odds ratios (OR) and 95% confidence intervals (CI), examined the associations between mental health outcomes in MF2 students versus USSM students (control group). Dependent variables included PHQ-9, GAD-7, and BRCS scores, classifying students into symptomatic versus below-threshold groups and low versus high copers, respectively. The primary independent variable was medical school affiliation (MF2 or USSM). Analyses adjusted for potential confounders, including age, gender, social support, financial issues, and aggregated unhealthy lifestyle and stressful events, to isolate the association between school affiliation and mental health outcomes.

Additionally, bivariate logistic regression within MF2 students identified predictors of scoring above cutoff values for depression, anxiety, and coping. Dependent variables were PHQ-9, GAD-7, and BRCS cutoff values.

All analyses were performed using Excel and jamovi (Ver. 2.3.38.0), with statistical significance set at $p < 0.05$.

Results

The total number of students who participated in the survey was 886, with 506 (57.1%) from MF2 and 380 (42.9%) from USSM (Table 1). The total number of students enrolled in MF2 was 800, while the Medicine program at USSM had 545 students enrolled, yielding response rates of 63% and 69%, respectively.

Most of the surveyed students were women (76.6%, $N = 679$). The mean age of the respondents was 20.8 years. USSM students had a slightly higher average age than those from MF2, and the proportion of women participants from MF2 was significantly higher than at USSM (Table 1). The representation of students enrolled in a specific study year at MF2 and USSM was different and largely driven by the variations in years 2, 4, and 6 (Table 1).

Regarding the mental health status of students before the first year of the Russian full-scale invasion of Ukraine, 37.5% of MF2 students reported mental health problems, in contrast to 6.2% of students at USSM (Table 1). There were 52.9% of MF2 students who noted a deterioration in their mental health during the first year of the war. Furthermore, MF2 students reported a higher incidence of other diseases requiring treatment and a worsening of their physical health compared to USSM students (Table 1).

When comparing demographic and lifestyle variables associated with mental health problems we noted that smoking and alcohol consumption were more prevalent in MF2 students compared to USSM students (16.2% vs 6.8% and 37.7% vs 28.6%, respectively; Table 2).

Table 1. Demographic characteristics and health status before and during the first year of war in Ukraine among students at Bogomolets National Medical University (MF2) and the University of Split School of Medicine (USSM).

Variable	MF2: N (%) or mean \pm SD	USSM: N (%) or mean \pm SD	Statistics	p-Value
N	506 (57.1)	380 (42.9)	/	
Age	20.5 \pm 2.3	21.3 \pm 2.5	t(883) = 4.95	p < 0.0001
Gender				
Men	89 (17.6)*	111 (29.2)		
Women	412 (81.4)	267 (70.3)	$\chi^2(2, N = 886) = 17.1$	p < 0.001
Other	5 (1)	2 (0.5)		
Current year of study				
Year 1	68 (17.17)	62 (17.6)		
Year 2	79 (19.95)*	84 (23.8)	$\chi^2(5, N = 749) = 15.1$	p = 0.01
Year 3	63 (15.91)	80 (22.7)		
Year 4	62 (15.66)*	45 (12.7)		
Year 5	74 (18.68)	60 (17.0)		
Year 6	50 (12.63)*	22 (6.2)		
Preexisting mental health problems (no/yes)	305 (62.5)/183 (37.5)	331 (93.8)/22 (6.2)	$\chi^2(1, N = 84) = 108.6$	p < 0.0001
Mental health status				
Improved	51 (10.5)*	99 (28.3)		
Did not change	76 (15.6)*	149 (42.2)	$\chi^2(3, N = 84) = 167.7$	p < 0.0001
Worsened	258 (52.9)*	61 (17.3)		
Difficult to answer	103 (21.1)*	43 (12.2)		
Treatment required diseases (no/yes)	360 (73.8)/128 (26.2)	305 (86.4)/48 (13.6)	$\chi^2(1, N = 84) = 19.7$	p < 0.0001
Physical health				
Improved	64 (13.1)	73 (20.6)		
Did not change	163 (33.4)*	195 (55.2)	$\chi^2(3, N = 84) = 73.4$	p < 0.0001
Worsened	199 (40.8)*	67 (19)		
Difficult to answer	62 (12.7)*	18 (5.1)		

*Asterisks mark significant post hoc differences calculated using the standardized residuals method. Residuals with an absolute value greater than 2 were considered significant.

The use of marijuana or other drugs was quite low in both MF2 and USSM students and did not significantly differ. Regular physical activity was equal in both groups of students (Table 2).

Frequent changes of sexual partners were more common, while safe sex practices were less common, among MF2 students compared to USSM students. When comparing the relationship statuses of students across the two cohorts, most of the students were single. However, a higher number of married students was observed at MF2. The majority of married students were women (84.8%, $N = 28$; Table 2).

Regarding social support, USSM students reported higher levels of support from family and friends than MF2 students (Table 2). Financial problems were more common in MF2 students. They reported more "constant financial problems" (15.4%, $N = 78$) and fewer instances of "no problems," while USSM students showed the opposite pattern. Additionally, a significantly higher number of MF2 students (46%, $N = 233$) had to work to support themselves compared to USSM students. The most common type of work for both groups of students was in the retail sector (32.7%, $N = 73$ for MF2 and 5.6%, $N = 32$ for USSM). For MF2 students, this was followed by online content creation, which was the chosen type of additional work for 14.4% ($N = 32$) of students, as indicated in Table 2. Most of the MF2 students involved in online content creation were women (90%, $N = 29$).

Most MF2 students resided in urban areas (88.7%, $N = 433$), while only 11% ($N = 55$) lived in villages. In terms of housing, students from both institutions reported similar accommodations, with the majority living with their families, followed by private accommodations. However, a slight difference between the MF2 and USSM cohorts was the result of variations in private accommodation and university housing, with more MF2 students living in university accommodations and fewer living in private accommodations. Moreover, a higher

proportion of MF2 students live with their romantic partners, and fewer of them with friends/colleagues compared to USSM students (Table 2). We also observed a significant difference in residence change between MF2 and USSM students with a higher proportion of MF2 students reporting a residence change (Table 2).

Social media and online news portals were the primary sources of information for students from both institutions. However, MF2 students spent considerably more time on social media, with 43.6% ($N = 213$) of them spending more than four hours per day on social media, in contrast to 19.9% ($N = 70$) of USSM students spending the same amount of time (Table 2). The popularity patterns among online sources also differed markedly; the Telegram channel was the most popular social media platform among MF2 students, while its use was negligible among USSM students (Figure 1).

Although examining the factors impacting the educational process is challenging due to the different circumstances at the two involved schools, as expected, 80.6% of MF2 students reported the war as the main factor affecting the educational process (Supplemental Table 1). Other reported factors included lack of electricity and internet access (79.1%), decreased concentration (67.8%), low motivation (49.1%), and online teaching (40.3%). At USSM, the primary disruptive factor for the educational process was decreased concentration (46.5%), followed by societal issues, as reported by 22.4% of students (Supplemental Table 1). The motivation to continue studying was higher for USSM students compared to MF2 (on a scale from 1 to 10, $t(748) = 10.6$, $p = 0.001$; Supplemental Table 1).

We also investigated variables specific to MF2 students (Supplemental Table 2). As anticipated, a significantly higher number of MF2 students (59.8%, $N = 292$) changed their place of residence compared to USSM students (4.3%, $N = 16$) during the observed period. Most MF2 students changed their

Table 2. Demographic and lifestyle variables associated with mental health problems among Bogomolets National Medical University (MF2) and University of Split School of Medicine (USSM) students.

Variable	MF2: N (%)	USSM: N (%)	Statistics	p-Value
<i>Habits</i>				
Smoking (no/yes)	409 (83.8)/79 (16.2)	329 (93.2)/24 (6.8)	$\chi^2(1, N = 841) = 16.8$	$p < 0.0001$
Alcohol (no/yes)	304 (62.3)/184 (37.7)	252 (71.4)/101 (28.6)	$\chi^2(1, N = 841) = 7.6$	$p = 0.006$
Marijuana (no/yes)	474 (97.1)/14 (2.9)	347 (98.3)/6 (1.7)	$\chi^2(1, N = 841) = 1.2$	$p = 0.27$
Other drugs (no/yes)	480 (98.4)/8 (1.6)	352 (99.7)/1 (0.3)	$\chi^2(1, N = 841) = 3.6$	$p = 0.06$
Exercise (no/yes)	271 (55.5)/217 (44.5)	208 (58.9)/145 (41.1)	$\chi^2(1, N = 841) = 0.96$	$p = 0.33$
Changing partners (no/yes)	471 (96.5)/17 (4.5)	342 (96.9)/11 (3.1)	$\chi^2(1, N = 841) = 0.09$	$p = 0.769$
Safe sex (no/yes)	146 (29.9)/342 (70.1)	29 (16.2)/150 (83.8)	$\chi^2(1, N = 668) = 12.7$	$p = 0.0004$
<i>Relationship status and social support</i>				
Single	261 (51.6)	243 (65)	$\chi^2(2, N = 743) = 27.8$	$p < 0.001$
In a relationship	212 (41.9)	135 (35.5)		
Married	33 (6.5)*	2 (0.5)		
Family/friend support (no/yes)	16 (3.3)/472 (96.7)	2 (0.6)/351 (99.4)	$\chi^2(1, N = 841) = 7.19$	$p = 0.007$
<i>Financial status</i>				
No problems	159 (31.4)*	288 (75.8)	$\chi^2(2, N = 886) = 173.6$	$p < 0.0001$
Occasional problems	269 (53.2)*	80 (21.1)		
Constant problems	78 (15.4)*	12 (3.2)		
Work during the study (no/yes)	273 (54)/233 (46)	311 (81.8)/69 (18.2)	$\chi^2(1, N = 886) = 73.9$	$p < 0.0001$
<i>Type of the work</i>				
Instructions for peers	22 (8.3)	5 (7)	/	/
Household help	22 (8.3)	6 (8.5)		
Retail sector	73 (27.7)	32 (45)		
Online content creation	32 (12.1)	1 (1.5)		
Other	115 (43.6)	27 (38)		
<i>Housing status</i>				
Family house	272 (55.7)	197 (55.8)	$\chi^2(2, N = 840) = 73.9$	$p = 0.045$
Private accommodation	148 (30.3)*	120 (42.4)		
University housing	67 (13.7)*	36 (10.2)		
<i>Living arrangements</i>				
Alone	69 (14.1)	59 (16.7)	$\chi^2(3, N = 840) = 81.5$	$p < 0.001$
With a romantic partner	102 (20.9)*	9 (2.6)		
With family	257 (53.7)	212 (60.1)		
With friends/colleagues	60 (12.3)*	73 (20.7)		

(continued)

Table 2. Continued

Variable	MF2: N (%)	USSM: N (%)	Statistics	p-Value
Residence change (yes/no)	292 (59.8)/196 (40.2)	16 (4.3)/338 (95.8)	$\chi^2(1, N = 842) = 451.7$	$p < 0.001$
The main source of news				
Television	64 (13.1)	43 (12.2)		
Social media	441 (90.4)	188 (53.3)		
Online portal	260 (53.3)	112 (31.7)		
Newspapers	2 (0.4)	2 (0.6)		
Other	20 (4.1)	8 (2.3)		
Use of social media				
No use of social media	1 (0.02)	3 (0.8)		
Less than 1 hour	43 (8.8)	38 (10.8)		
2–3 hours	231 (47.3)*	242 (68.6)		
More than 4 hours	213 (43.6)*	70 (19.9)	$\chi^2(3, N = 933) = 99.5$	$p < 0.0001$

*Asterisks mark significant post hoc differences calculated using the standardized residuals method. Residuals with an absolute value greater than 2 were considered significant.

residence once (45%, $N = 104$), 39.8% ($N = 92$) changed their residence 2–3 times, while 15.2% ($N = 35$) were forced to change their residence more than three times (Supplemental Table 2). The primary reasons for changing residence were security reasons (71.9%, $N = 168$), followed by family reasons (27.7%, $N = 64$), and access to educational institutions (27.7%, $N = 64$). Most students moved from central parts of Ukraine (67.5%, $N = 156$), with only 11.7% ($N = 27$) moving from the eastern parts and 6.9% ($N = 16$) from southern regions.

Among the variables specific to MF2 students, we examined war-related extracurricular activities. Volunteering emerged as the most prevalent activity, involving 58.7% of students, followed by gathering data about the war (17.4%) and working at a hospital (14.4%). Only 1% of MF2 students served in the army during the observed period (Supplemental Table 2).

Overall exposure to stressful events was similar for both groups. However, the nature of these events differed between the schools. As expected, USSM students did not experience any exposure to war-related violence, while 23.5% of MF2 students were exposed to or witnessed such violence. USSM students reported higher incidents of accidental violence and interpersonal violence compared to MF2 students (Table 3).

The average PHQ-9 scores, indicating higher levels of depression, were higher in MF2 students compared to USSM students. The mental health assessment of the surveyed students revealed that 52% ($N = 223$) of MF2 students exhibited symptoms of depression (cut-off ≥ 10), compared to 29.5% ($N = 104$) of USSM students showing similar symptoms (Table 4).

Perceived signs of anxiety were also more pronounced in MF2 students (44.8%, $N = 179$) compared to USSM students (24.6%, $N = 87$; Table 4). Coping abilities were considerably lower among MF2 students, with only 15.8%

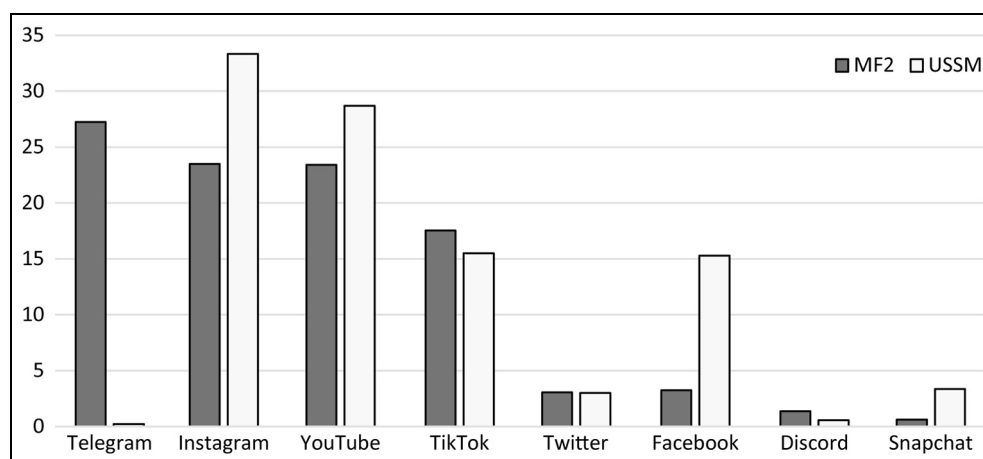


Figure 1. Patterns of social media usage among Bogomolets National Medical University (MF2) and University of Split School of Medicine (USSM) students.

Table 3. Exposure to stressful life events in Bogomolets National Medical University (MF2) and University of Split School of Medicine (USSM) students measured with the Life Events Checklist for DSM-5 (LEC-5) scale.

LEC result	MF2: N (%) or mean \pm SD	USSM: N (%) or mean \pm SD	Statistics	p-Value
Total weighted score	10.3 \pm 7.1	10.5 \pm 7.7		
Total experienced events	2.5 \pm 2.6	3.0 \pm 2.6		
Experienced events				
Accidental violence	78/506 (15.4%)*	100/380 (26.3%)	$\chi^2(5, N = 953) = 113$ $p < 0.0001$	
Interpersonal violence	53/506 (10.5%)*	66/380 (17.4%)		
Sexual violence	43/506 (8.5%)*	38/380 (10%)		
War-related violence	119/506 (23.5%)*	0/380		
Death-suffering event	65/506 (12.8%)*	62/380 (16.3%)		
Other types of stressful events	194/506 (38.3%)*	135/380 (35.5%)		

Asterisks mark significant post hoc differences calculated using the standardized residuals method. Residuals with an absolute value greater than 2 were considered significant.

expressing high coping abilities, compared to 23.5% of USSM students (Table 4).

The results of the binomial logistic regression suggest that students at MF2 reported more depression (OR 1.89; 95% CI 1.27–2.82, $p = 0.002$) and anxiety symptoms (OR 1.59; 95% CI 1.05–2.40, $p = 0.028$) that meet or exceed the established thresholds compared to USSM students. This indicates a significant increase in the likelihood of experiencing

depression and anxiety for students studying at MF2 relative to those at USSM (Table 5). The regression was performed by taking into account all the previously mentioned potential confounding variables.

All models performed adequately in terms of statistical measures of fit, with the PHQ-9 model slightly outperforming the GAD-7 model in terms of the proportion of variance explained (R^2 values). These results suggest

Table 4. Frequencies and percentages of scores for depression, anxiety, and coping abilities among Bogomolets National Medical University (MF2) and University of Split School of Medicine (USSM) students.

	MF2: N (%) or mean \pm SD	USSM: N (%) or mean \pm SD	Statistics	p-Value
<i>PHQ-9 score</i>	10.8 \pm 7.1	7.6 \pm 5.6	$t(776) = 6.9$	$p < 0.0001$
Minimal depression (1–4)	91 (21.3)*	121 (34.3)	$\chi^2(4, N = 368) = 55.8$	$p < 0.0001$
Mild depression (5–9)	112 (26.2)	128 (36.3)		
Moderate depression (10–14)	93 (21.8)	67 (19.0)		
Moderately severe depression (15–19)	68 (15.9)*	21 (5.9)		
Severe depression (20–27)	63 (14.8)*	16 (4.5)		
Cut off ≥ 10	223 (52.2)	104 (29.5)	$\chi^2(1, N = 780) = 41$	$p < 0.0001$
<i>GAD-7 score</i>	9.5 \pm 5.9	6.8 \pm 5.2	$t(751) = 6.6$	$p < 0.0001$
Minimal anxiety (0–4)	99 (24.8)*	149 (42.2)	$\chi^2(3, N = 753) = 39.23$	$p < 0.0001$
Mild anxiety (5–9)	122 (30.5)	117 (33.1)		
Moderate anxiety (10–14)	89 (22.3)*	43 (12.2)		
Severe anxiety (15–21)	90 (22.5)*	44 (12.5)		
Cut off ≥ 10	179 (44.8)	87 (24.6)		$p < 0.0001$
<i>BRCS score</i>	13.6 \pm 3.3	14.5 \pm 2.8		
Low resilient coping (4–13)	172 (43.1)*	104 (29.5)	$\chi^2(2, N = 751) = 17.1$	$p < 0.0001$
Medium resilient coping (14–16)	164 (41.1)	166 (47.0)		
High resilient coping (17–20)	63 (15.8)	83 (23.5)		

*Asterisks mark significant post hoc differences calculated using the standardized residuals method. Residuals with an absolute value greater than 2 were considered significant.

that the predictors included in the PHQ-9 model may capture more nuances related to depressive symptoms than those in the GAD-7 model for anxiety symptoms. Overall, the analyses demonstrate the models' capabilities to reasonably predict mental health outcomes based on various predictors, including demographic and psychosocial factors. However, the differences in the fit indices between the two models suggest that additional factors might influence the prediction of anxiety compared to depression, or that these conditions have different underlying dynamics in relation to the predictors used. Studying at MF2 was associated with a lower likelihood of reporting effective coping skills, as evidenced by an odds ratio of 0.488 (95% CI 0.32–0.74, $p < 0.001$; Table 5). This finding indicates a substantial negative impact on coping abilities for the students of MF2 compared to USSM students.

Table 5. Comparison of mental health risks to MF2 versus USSM medical students adjusted for age, gender, unhealthy lifestyle, social support, financial problems, and aggregated stressful events.

Variable	Adjusted OR (95% CI)	p-Value
PHQ-9	1.89 (1.27–2.82)	$p < 0.001$
GAD7	1.59 (1.05–2.4)	$p < 0.001$
BRCS	0.49 (0.32–0.74)	$p < 0.001$

PHQ-9: patient health questionnaire; GAD7: generalized anxiety disorder; BRCS: Brief Resilient Coping Scale.

The logistic regression performed on MF2 students with the dependent variable of being above or below threshold values for PHQ-9, GAD-7, and BRCS is presented in Supplemental Table 3. The analysis provided information on the factors affecting coping skills, and depressive and anxiety symptoms in

MF2 students. Financial problems and other stressful life events were identified as strong predictors. For depression, significant predictors included age, financial problems, the presence of mental diseases, and other stressful events. Regarding anxiety, significant predictors were age, gender, financial problems, the presence of mental and other diseases, smoking, and other stressful events.

Discussion

The results of our study indicate that the Russian full-scale invasion of Ukraine, which began in February 2022, is significantly associated with worsened mental health among Ukrainian medical students, as evidenced by increased depression and anxiety symptoms compared to a control group from Croatia. During the invasion's first year, 52.2% of Ukrainian students reported signs of depression, while 44.8% reported anxiety symptoms. Additionally, their coping capabilities were notably reduced, leaving them without the self-regulating mechanisms that typically provide protection. Beyond anxiety, depression, and reduced coping capabilities, Ukrainian students in our study reported that the war negatively impacted their education due to war-related dangers (80.6%), 79.1% cited lack of electricity and internet, 67.8% noted decreased concentration and 49.1% reported low motivation.

Among Ukrainian students, 37.5% reported having preexisting mental health problems before the first year of the full-scale invasion. This high percentage is likely because the war in Ukraine began in 2014 with the annexation of Crimea and the conflict in Donbas, leading to prolonged exposure to war-related stressors. In contrast, only 6.2% of Croatian students reported preexisting mental health problems during the year preceding the study.

These results align with findings from other studies on mental health during the first year of the full-scale war in Ukraine. An online survey of adults aged 18 and older revealed high levels

of psychological distress, with 54.1% reporting anxiety symptoms and 46.8% exhibiting depression symptoms (Xu et al., 2023).

Similar effects were observed in adolescents. Those in regions first invaded in 2014 reported higher trauma, PTSD, anxiety, and depression levels than peers in central Ukraine (Osokina et al., 2023). Another study linked war trauma exposure to suicidality or self-harm behavior in Ukrainian adolescents (Sourander et al., 2024). University students also frequently reported trauma exposure, nightmares, insomnia, and PTSD symptoms (Pavlova and Rogowska, 2023). However, a repeated cross-sectional study found that stress, anxiety, and life satisfaction levels among students during the war were similar to those during the pandemic, while depression symptoms decreased (Pavlova et al., 2024). These findings, however, are limited to students in western Ukraine, where hostilities were less intense. The mental health impact on Ukrainian students aligns with findings from other conflict-affected regions. In Ethiopia, adolescent war survivors showed high PTSD and depression rates (Yigzaw et al., 2023), while a Sri Lankan study found that social support and resilience protected adolescents from hopelessness and depression (Dissanayake et al., 2023).

These findings suggest that the mental health outcomes of medical students in our study are largely consistent with those reported in other population groups, such as adolescents and the general Ukrainian population. For example, our results show that GAD scores among Ukrainian medical students were 15% higher, while PHQ scores were 6.2% lower compared to non-medical Ukrainian students during the first year of the war versus the COVID-19 pandemic (Pavlova and Rogowska, 2023). This challenges the common perception that medical students are more prone to mental health problems.

Regarding the limited number of studies investigating mental health consequences of war among medical students, 60.6% of Syrian medical students reported moderate to severe

depressive symptoms, 52.6% experienced stress, and 35.1% suffered from anxiety during the war in their country (Al Saadi et al., 2017). However, during the civil war and COVID-19 pandemic in Libya, medical students reported GAD-7 and PHQ-9 scores of 7.2 and 9.7, respectively (Elhadi et al., 2020). Ukrainian medical students in our study reported GAD-7 and PHQ-9 scores 24.2% and 10.2% higher, respectively, than those in Libya. However, comparing our results with others is challenging due to the uniqueness of each war setting and the fact that some studies did not distinguish the effects of COVID-19 from those of war.

When interpreting our findings alongside similar studies, it is crucial to consider the stigma surrounding mental health in both the general and medical communities, which often leads to underreporting. This stigma discourages individuals from seeking help, exacerbating their conditions and diminishing their quality of life. For instance, despite high rates of depression, anxiety, and PTSD, more than half of Ukrainian adolescents would not seek psychological support (Chudzicka-Czupala et al., 2023). Among medical students, this stigma may be even stronger, further restricting access to essential mental health care.

The adjustment of covariates to control for their potential confounding effect on the relationship between affiliation and mental health outcomes confirmed that gender significantly contributes to predicting mental health outcomes, consistent with previous findings (Lim et al., 2018). Similar patterns were observed among Ukrainian university students and adolescents (Pavlova and Rogowska, 2023; Sourander et al., 2024). Notably, women in war zones face additional vulnerabilities, including increased risks of sexual violence, widowhood, and inadequate maternal care (Jain et al., 2022). Among MF2 students, alcohol and smoking were more common, while safe sex practices were less frequent compared to USSM students. In contrast, USSM students reported higher levels of

family and peer support than MF2 students. Limited social connections may increase loneliness and stress, exacerbating mental health issues such as depression, as observed in previous studies (Block et al., 2022). However, more MF2 students were married and living with their romantic partners, which may help mitigate their mental health burden.

Financial stress is another potential contributing factor, as many MF2 students work while studying. Excessive social media use, reported more frequently among MF2 students, can also negatively impact mental health. Problematic social media use has been linked to mental distress, including mood disorders, sleep disturbances, and self-harm ideation, as demonstrated by numerous studies (Nazari et al., 2023; Ravi et al., 2022; Sserunkuuma et al., 2023). However, this must be interpreted within Ukraine's war context, where social media serves both as an educational tool and a critical source of war-related news and air alerts, often disseminated via platforms like Telegram (Nisar et al., 2022).

Displacement is a significant stressor for MF2 students, with nearly 45% relocating once, 39.8% moving 2–3 times, and 15.2% forced to relocate more than three times within a year due to security concerns. According to previous studies, the psychological toll of frequent displacement can have long-term effects, often requiring sustained mental health support (Szabo et al., 2016).

Among MF2 students, 78.5% engaged in war-related extracurricular activities, helping them manage stress and find purpose. These activities benefit public psychological health, reduce political tensions, and strengthen social cohesion (Marusic, 1994). Medical students often balance academics with roles in medical aid, first aid training, and human rights documentation, enhancing both community support and personal well-being (Gluncic et al., 2001). Volunteering was the most common activity, reported by 58.7% of MF2 students.

Our study's results must be viewed in the context of the COVID-19 pandemic, which

amplified mental health issues, especially among students. While some studies found no significant anxiety changes in medical students (Lasheras et al., 2020), others reported higher depression and anxiety rates compared to the general population and healthcare workers (Jia et al., 2022). This inconsistency led us to include USSM students as a control group, though their better mental health outcomes may reflect the time elapsed since the pandemic (Salari et al., 2020).

While our study adds to the limited research on war trauma among medical students, it has several limitations. First, the sample is restricted to one medical institution in Kyiv, limiting generalizability, especially to Eastern Ukraine, where attacks persist. Second, using USSM students as a reference group has drawbacks, as Russian aggression affects individuals beyond Ukraine, including European adolescents and adults (Chudzicka-Czupala et al., 2023; Lass-Hennemann et al., 2023; Riad et al., 2022). Third, the cross-sectional design lacks a pre-war baseline, making it difficult to attribute psychological effects solely to war. Finally, self-reported data may introduce bias, and while we used validated psychometric tools, some (LEC-5 and BRCS) were not formally validated in Croatian or for this specific population, potentially affecting reliability. Additionally, dichotomized answers may have oversimplified constructs or reduced statistical power. These limitations should be considered in future research.

Despite these limitations, our study provides important insights into the mental health challenges faced by Ukrainian medical students during the first year of Russia's full-scale invasion. These findings emphasize the urgent need for targeted support strategies to mitigate the war's impact on both their psychological well-being and educational experience.

Authors' contributions

DS and TK conceptualized the study. OF, LG and INO collected the data. DS, MS, and OI performed statistical analyses and prepared tables. All authors

participated in the interpretation of data. DS drafted the initial version of the manuscript. All the authors contributed to revising, editing, and finalizing the manuscript. DS was the principal investigator and acted as the mentor for the project. All authors read and approved the final manuscript.

Acknowledgements

We would like to thank all the students who participated in this study. This work is part of the Translational Research in Biomedicine (TRIBE) doctoral program project "Giving Voice" (<https://mefst.unist.hr/studies/graduate-school/tribe/giving-voice/12280>), which helps Ukrainian authors publish reports about the consequences of the War in Ukraine.

Data sharing statement

The raw data are available upon request.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the TRIBE postgraduate program at the University of Split School of Medicine, Split, Croatia. The support included voluntary time invested in the preparation of the manuscript but no direct funding.

Ethics approval


The study received approval from the Ethics Committee at Bogomolets National Medical University (protocol No. 172, 22 May 2023) and the Ethics Committee of USSM (No. 003-08/23-03/0015).

Informed consent

Participants provided their consent to participate on the first page of the online survey, ensuring participation was anonymous. All authors consented to the publication of the study.


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Supplemental material

Supplemental material for this article is available online.

References

- Al Saadi T, Addeen SZ, Turk T, et al. (2017) Psychological distress among medical students in conflicts: A cross-sectional study from Syria. *BMC Medical Education* 17(1): 173.
- Block VJ, Haller E, Villanueva J, et al. (2022) Meaningful relationships in community and clinical samples: Their importance for mental health. *Frontiers in Psychology* 13: 832520.
- CDC NCHS (2020) *National Health Interview Survey: Early release of selected mental health estimates based on data from January–June 2019*. Available at: <http://www.cdc.gov/nchs/data/nhis/earlyrelease/ERmentalhealth-508.pdf> (accessed 31 March 2020).
- Cheah YK, Azahadi M, Phang SN, et al. (2020) Sociodemographic, lifestyle, and health factors associated with depression and generalized anxiety disorder among Malaysian adults. *Journal of Primary Care & Community Health* 11: 1–8.
- Christophers B, Nieblas-Bedolla E, Gordon-Elliott JS, et al. (2021) Mental health of US medical students during the COVID-19 pandemic. *Journal of General Internal Medicine* 36(10): 3295–3297.
- Chudzicka-Czupala A, Hapon N, Chiang SK, et al. (2023) Depression, anxiety and post-traumatic stress during the 2022 Russo-Ukrainian war, a comparison between populations in Poland, Ukraine, and Taiwan. *Scientific Reports* 13(1): 3602.
- Dissanayake L, Jabir S, Shepherd T, et al. (2023) The aftermath of war; mental health, substance use and their correlates with social support and resilience among adolescents in a post-conflict region of Sri Lanka. *Child and Adolescent Psychiatry and Mental Health* 17(1): 101.
- Dmytriiev D, Nazarchuk O, Gambiroža L, et al. (2023) Association between catastrophizing, post-operative pain, and injury severity in soldiers injured during the first year of the war in Ukraine: A cross-sectional study. *ST-OPEN* 4: e2023.2319.9.
- Dyrbye LN, West CP, Satele D, et al. (2014) Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. *Academic Medicine* 89(3): 443–451.
- Elhadi M, Buzreg A, Bouhuwaish A, et al. (2020) Psychological impact of the civil war and COVID-19 on Libyan medical students: A cross-sectional study. *Frontiers in Psychology* 11: 570435.
- Eysenbach G (2004) Improving the quality of web surveys: The checklist for reporting results of internet e-surveys (CHERRIES). *Journal of Medical Internet Research* 6(3): e34.
- Farrer LM, Gulliver A, Bennett K, et al. (2016) Demographic and psychosocial predictors of major depression and generalised anxiety disorder in Australian university students. *BMC Psychiatry* 16: 241.
- Ferrari AJ, Santomauro DF, Mantilla Herrera AM, et al. (2022) Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: A systematic analysis for the global burden of disease study 2019. *The Lancet Psychiatry* 9(2): 137–150.
- Fontanarosa PB, Flanagan A and Golub RM (2022) Catastrophic health consequences of the war in Ukraine. *JAMA* 327(16): 1549–1550.
- Gluncic V, Pulanic D, Prka M, et al. (2001) Curricular and extracurricular activities of medical students during war, Zagreb University School of Medicine, 1991–1995. *Academic Medicine* 76(1): 82–87.
- Goniewicz K, Burkle FM, Dzhus M, et al. (2023) Ukraine's healthcare crisis: Sustainable strategies for navigating conflict and rebuilding for a resilient future. *Sustainability* 15(15): 11602.
- Gostin LO and Rubenstein LS (2022) Attacks on health care in the war in Ukraine: International

- law and the need for accountability. *JAMA* 327(16): 1541–1542.
- Harvey SB, Laird B, Henderson M, et al. (2009) *The Mental Health of Health Care Professionals: A Review for the Department of Health*. London: King's College.
- Jain N, Prasad S, Czárth ZC, et al. (2022) War psychiatry: Identifying and managing the neuropsychiatric consequences of armed conflicts. *Journal of Primary Care & Community Health* 13: 1–13.
- Jia Q, Qu Y, Sun H, et al. (2022) Mental health among medical students during COVID-19: A systematic review and meta-analysis. *Frontiers in Psychology* 13: 846789.
- Jupina M, Sidle MW and Rehmeyer Caudill CJ (2022) Medical student mental health during the COVID-19 pandemic. *The Clinical Teacher* 19(5): e13518.
- Korda M, Shulhai A, Shevchuk O, et al. (2024) Psychological well-being and academic performance of Ukrainian medical students under the burden of war: A cross-sectional study. *Frontiers in Public Health* 12: 1457026.
- Kroenke K, Spitzer RL and Williams JB (2001) The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine* 16(9): 606–613.
- Kurapov A, Pavlenko V, Drozdov A, et al. (2023) Toward an understanding of the Russian-Ukrainian war impact on university students and personnel. *Journal of Loss and Trauma* 28(2): 167–174.
- Lasheras I, Gracia-García P, Lipnicki DM, et al. (2020) Prevalence of anxiety in medical students during the COVID-19 pandemic: A rapid systematic review with meta-analysis. *International Journal of Environmental Research and Public Health* 17(18): 6603.
- Lass-Hennemann J, Sopp MR, Ruf N, et al. (2023) Generation climate crisis, COVID-19, and Russia-Ukraine-War: Global crises and mental health in adolescents. *European Child & Adolescent Psychiatry* 33(7): 2203–2216.
- Lim GY, Tam WW, Lu Y, et al. (2018) Prevalence of depression in the community from 30 countries between 1994 and 2014. *Scientific Reports* 8(1): 2861.
- Liu YC, Kuo RL and Shih SR (2020) COVID-19: The first documented coronavirus pandemic in history. *Biomedical Journal* 43(4): 328–333.
- Lu Z, Sun Y, Liao Y, et al. (2023) Identifying causal associations between early sexual intercourse or number of sexual partners and major depressive disorders: A bidirectional two-sample Mendelian randomization analysis. *Journal of Affective Disorders* 333: 121–129.
- Marusic M (1994) War and medical education in Croatia. *Academic Medicine* 69(2): 111–113.
- Milić J, Skitarelić N, Majstorović D, et al. (2024) Levels of depression, anxiety and subjective happiness among health sciences students in Croatia: A multi-centric cross-sectional study. *BMC Psychiatry* 24(1): 50.
- Mollica RF, Cardozo BL, Osofsky HJ, et al. (2004) Mental health in complex emergencies. *The Lancet* 364(9450): 2058–2067.
- Murthy RS and Lakshminarayana R (2006) Mental health consequences of war: A brief review of research findings. *World Psychiatry* 5(1): 25–30.
- Nazari A, Hosseinnia M, Torkian S, et al. (2023) Social media and mental health in students: A cross-sectional study during the Covid-19 pandemic. *BMC Psychiatry* 23(1): 458.
- Nisar S, Alshanberi AM, Mousa AH, et al. (2022) Trend of social media use by undergraduate medical students; A comparison between medical students and educators. *Annals of Medicine and Surgery (London)* 81: 104420.
- Osokina O, Silwal S, Bohdanova T, et al. (2023) Impact of the Russian invasion on mental health of adolescents in Ukraine. *The Journal of the American Academy of Child and Adolescent Psychiatry* 62(3): 335–343.
- Pavlova I and Rogowska AM (2023) Exposure to war, war nightmares, insomnia, and war-related posttraumatic stress disorder: A network analysis among university students during the war in Ukraine. *Journal of Affective Disorders* 342: 148–156.
- Pavlova I, Rogowska AM and Zhang SX (2024) Mental health and well-being during the COVID-19 pandemic and after the Russian invasion of Ukraine. *Journal of Community Health* 49(1): 173–182.
- Pfizer (2025) *Patient health questionnaire screeners*. Available at: <https://www.phqscreener.com/select-screener> (accessed 17 February 2025).
- Quek TT, Tam WW, Tran BX, et al. (2019) The global prevalence of anxiety among medical students: A meta-analysis. *International Journal of*

- Environmental Research and Public Health* 16(15): 2735.
- Ravi D, Chandran S and Sreedaran P (2022) Social media use for the dissemination of mental health information by medical students. *Journal of Psychiatry Spectrum* 1(2): 117–120.
- Riad A, Drobov A, Krobot M, et al. (2022) Mental health burden of the Russian-Ukrainian war 2022 (RUW-22): Anxiety and depression levels among young adults in central Europe. *International Journal of Environmental Research and Public Health* 19(14): 8418.
- Rotenstein LS, Ramos MA, Torre M, et al. (2016) Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: A systematic review and meta-analysis. *JAMA* 316(21): 2214–2236.
- Salari N, Hosseini-Far A, Jalali R, et al. (2020) Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Global Health* 16(1): 57.
- Shevlin M, Hyland P, Karatzias T, et al. (2022) The Ukraine crisis: Mental health resources for clinicians and researchers. *Journal of Traumatic Stress* 35(3): 775–777.
- Sinclair VG and Wallston KA (2004) The development and psychometric evaluation of the Brief Resilient Coping Scale. *Assessment* 11(1): 94–101.
- Sourander A, Silwal S, Osokina O, et al. (2024) Suicidality and self-harm behavior of adolescents during the early phase of the war in Ukraine. *The Journal of the American Academy of Child and Adolescent Psychiatry* 63(12): 1204–1214.
- Spitzer RL, Kroenke K, Williams JB, et al. (2006) A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine* 166(10): 1092–1097.
- Srichawla BS, Khazeei Tabari MA, Găman MA, et al. (2022) War on Ukraine: Impact on Ukrainian medical students. *International Journal of Medical Students* 10(1): 15–17.
- Sserunkuuma J, Kagawa MM, Muwanguzi M, et al. (2023) Problematic use of the internet, smartphones, and social media among medical students and relationship with depression: An exploratory study. *PLoS One* 18(5): e0286424.
- Szabo A, Ward C and Jose PE (2016) Uprooting stress, coping, and anxiety: A longitudinal study of international students. *International Journal of Stress Management* 23(2): 190–208.
- Takoutsing BD, Găman MA, Puyana JC, et al. (2023) The silent casualties: War's impact on medical students and medical education. *International Journal of Medical Students* 11(4): 254–258.
- Vidović S, Kotromanović S and Pogorelić Z (2024) Depression, anxiety, and stress symptoms among students in Croatia during the COVID-19 pandemic: A systematic review. *Journal of Clinical Medicine* 13(20): 6240.
- von Elm E, Altman DG, Egger M, et al. (2008) The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. *Journal of Clinical Epidemiology* 61(4): 344–349.
- Wang C, Yan SJ, Jiang H, et al. (2022) Socio-demographic characteristics, lifestyles, social support quality and mental health in college students: A cross-sectional study. *BMC Public Health* 22(1): 1583.
- Weathers FWBD, Schnurr PP, Kaloupek DG, et al. (2013) *The life events checklist for DSM-5 (LEC-5)*. Instrument available from the National Center for PTSD, Available at: www.ptsd.va.gov (accessed 25 January 2013).
- Weigelt A and Kizilhan JI (2024) The Ukrainian version of the perceived injustice questionnaire: A psychometric evaluation. *Frontiers in Psychiatry* 15: 1446724.
- Weis CN, Webb EK, Stevens SK, et al. (2022) Scoring the life events checklist: Comparison of three scoring methods. *Psychological Trauma* 14(4): 714–720.
- Xu W, Pavlova I, Chen X, et al. (2023) Mental health symptoms and coping strategies among Ukrainians during the Russia-Ukraine war in March 2022. *International Journal of Social Psychiatry* 69(4): 957–966.
- Yigzaw N, Hailu T, Melesse M, et al. (2023) Comprehensive mental health and psychosocial support for war survivors at Chenna Kebele, Dabat Woreda, North Gondar, Ethiopia. *BMC Psychiatry* 23(1): 172.