

Kostetska O. O., Yurochko T. P., Shevchenko M. V.

The impact of the war in Ukraine on the prevalence of mental disorders among healthcare workers

National University of "Kyiv-Mohyla Academy",
Kyiv, Ukraine

Костецька О. О., Юрочко Т. П., Шевченко М. В.

Вплив війни в Україні на поширеність психічних розладів у медичних працівників

Національний університет «Києво-Могилянська академія», м. Київ, Україна

m.shevchenko@ukma.edu.ua

Introduction

The mental health of healthcare workers operating under stressful conditions is a widely studied topic worldwide [1–3]. Studies on the impact of the COVID-19 pandemic have provided concrete data on case prevalence, risk factors, and strategies for psychological resilience among healthcare personnel facing severe occupational stress [4; 5].

The impact of the full-scale war in Ukraine, which began on February 24, 2022, has been comprehensive and unprecedented, significantly affecting all spheres of society and the functioning of the state. Ukraine's healthcare system is no exception, as, in addition to the significant material damage inflicted upon it by the Russian army – which is well-documented in other sources – the system has faced the consequences of severe psychological trauma among medical personnel.

It is civilian healthcare personnel, along with other essential workers, who bear the responsibility of providing medical aid and related services to the entire population in need. Work during the war has been significantly complicated by a range of circumstances, including threat to the personnel's physical integrity due to artillery shelling and missile attacks across the whole territory of the country, as well as other war-related dangers, concerns for safety of their families and close persons, increased workload, logistical constraints due to the supply shortages and the outflow of personnel, need to treat severely wounded patients – both military men and the civilians.

These stressors cumulatively affect the mental health of the healthcare workers considerably, increasing their risk of developing mental disorders, especially those associated with stress, such as PTSD, depression, and anxiety. There is consistent evidence indicating that the mentioned mental disorders are often associated with comorbidities and/or impairment of a person's professional and social functioning.

The purpose of this study is to investigate the prevalence of symptoms of certain mental disorders among healthcare workers who have been exposed to war-related stress in Ukraine.

Object, materials, and research methods

The object of the study is healthcare workers employed in healthcare facilities in the Zakarpattia, Dnipropetrovsk, Donetsk, and Poltava regions; the subject of the study is mental health among healthcare professionals under conditions of the full-scale war.

The present paper is a cross-sectional study, as it involves observing the sample at a single point in time. Quantitative strategy has been selected as an instrument to collect and analyze data to understand the scale of the problem being investigated (i.e., the prevalence of mental disorders among the healthcare professionals practicing during the full-scale war) as well as the peculiarities of this phenomenon, and the associated trends. For this study, a combination of convenience and purposive sampling has been used.

Eight hospitals in four regions of Ukraine have been included in the study: Zakarpattia, Poltava, Dnipropetrovsk, and Donetsk. The selection of the regions was informed by their proximity to areas of active hostilities and by the impact of the full-scale war on their populations and healthcare infrastructure. In particular, the Donetsk region has been the site of active hostilities even before the full-scale invasion, with hostilities intensifying significantly since 2022. At the moment of this study, the healthcare infrastructure in the Donetsk region was overwhelmed with a great number of wounded soldiers and civilians, thus suffering an unprecedented workload while simultaneously being under direct attacks of the Russian army.

The Dnipropetrovsk region is located closest to the areas of the most intense fighting. Thanks to its location, the region has become a major logistics hub for all military, volunteer, and other personnel moving between the front lines and the rear. Consequently, the medical infrastructure of Dnipropetrovsk region has shouldered a massive burden in providing medical care to both the civilian population fleeing areas of active combat and to a large number of wounded soldiers, especially those requiring specialized care. Thus, the Donetsk and Dnipropetrovsk regions are classified as "frontline regions" for this study.

The Poltava region is located in central Ukraine, and no combat operations have taken place within its

territory. However, the region is home to a significant number of internally displaced persons (IDPs). Additionally, the region is affected by other indirect consequences of the war, such as disruptions to logistics and supply chains, as well as the outflow of medical personnel leaving Ukraine or moving further west. The Zakarpattia region is the farthest from active hostilities, as it is located in the far west of the country. Although geographically distant from active hostilities, the region has experienced a significant influx of IDPs, which has placed a heavy burden on its infrastructure, particularly the healthcare system. In addition, Poltava and Zakarpattia regions, like any other regions of Ukraine, are constantly under the threat of missile strikes on civilian targets. Poltava and Zakarpattia regions are classified as “remote from the front line” for this study.

The selection of hospitals in these regions was based on the following criteria: a) willingness and ability to participate in the study; b) geographic location within one of the four selected regions; c) a valid contract with the National Health Service of Ukraine; d) provision of basic outpatient and inpatient services (including surgical services); e) active participation in treating war victims and/or internally displaced persons. Based on these criteria, the study included 8 facilities that provided both primary (4) and inpatient (4) medical care.

The sample of 454 respondents was collected via an online survey distributed through Google Forms, with instructions to ensure transparency and build trust in the data's reliability.

The mental health assessment included the PCL-5, PHQ-9, and GAD-7 questionnaires, demonstrating a comprehensive approach to evaluating respondents' psychological well-being.

Post-traumatic stress disorder: the PCL-5 questionnaire was used – a self-report questionnaire that assesses 20 PTSD symptoms according to the DSM-5. For this study, the total symptom severity score on the PCL-5 (range 0-80) was calculated by summing the 20 items. In accordance with official recommendations for the use of the PCL-5, a threshold of 31–33 points was used as an indicator of a preliminary PTSD diagnosis, aligning with established clinical standards to ensure comparability and validity of findings.

Depression: Patient Health Questionnaire-9 (PHQ-9) is a self-assessment questionnaire used to screen individuals for symptoms of depression. In the PHQ-9, each of the nine DSM-IV criteria for depression is rated on a scale from “02” (not at all) to “3” (almost every day). Regarding the interpretation of results, a score of 5–9 indicates mild depression, 10–15 indicates moderate depression, 15–19 indicates moderate-to-severe depression, and 20–27 indicates severe depression. These cut-off scores were used to interpret the results in this study.

Anxiety: Generalized Anxiety Disorder Scale (GAD-7) as a tool for identifying potential cases of GAD during initial screening. Based on meta-analysis data, experts recommend using a threshold of 8 points for a preliminary diagnosis of GAD [6].

The study has the following limitations, which were taken into account during the analysis of its results:

a) recruitment of participants and non-random selection of respondents. The sampling approach employed used purposive and convenience sampling; however, this limits the ability to generalize the study's results to the entire population;

b) lack of observation of trends over time. The cross-sectional study design allows for the examination of issues only at a specific point in time;

c) reliance on self-report and the potential inadequacy of the symptomatic criteria of the screening instruments used. The reliance on a self-report-based approach allowed only for preliminary screening of mental health issues among respondents.

The Research Ethics Committee of the National University of Kyiv-Mohyla Academy reviewed the research protocol and approved the study. The study design, including the approaches to sample selection, data collection, and data analysis, ensured full compliance with all relevant ethical requirements. Respondents' participation in the study was voluntary and based on full informed consent. Confidentiality of the respondents' information has been guaranteed, as their responses have been processed and the data analyzed on a depersonalized basis.

Research results

The dataset analyzed consisted of 454 unique responses. Of these, 402 (88.5%) were from women and 52 (11.5%) from men. The average age of the participants was 44 years. The majority of respondents were nurses (57.9%), followed by physicians (32.2%). Managers (5.9%), residents (1.1%), and other staff (2.9%) were represented by significantly smaller proportions. 66.5% of respondents did not specify their specialty. General practitioners accounted for 17.7% of respondents, while other specialties accounted for a small proportion. The majority of respondents (79.3%) had significant professional experience, having worked for more than ten years, while 13.4% were young professionals with less than five years of experience.

When asked about their working conditions during the full-scale war, 28.2% of respondents reported working 8–12 hours, while 16.7% reported working more than 12 hours per day. Besides, 77.3% of the respondents worked 5–6 days per week, while 7% worked 6–7 days per week. 23.6% of all respondents reported experiencing physical threats or personal safety concerns due to missile attacks, artillery shelling, proximity to combat, etc., in the course of their work. 17% of the respondents treated severely wounded patients, including those due to war casualties, while 56.6% had to deal with a large number of IDPs. Besides, 29.5% of study participants reported experiencing a shortage of medical personnel at a healthcare facility, 12.8% – a shortage of supplies, 22.2% – a shortage of hospital beds. 17.4% of all the respondents had to perform job duties beyond their

primary specialties during the war. Information on the respondents' working conditions during the full-scale war is presented in general in Table 1 and by region in Table 2 below.

Position at a healthcare facility, professional experience, encounter with physical threat (personal unsafety), experience of treating severely wounded patients, dealing with a large number of IDPs, shortage of medical personnel and supplies, as well as the necessity to perform job duties beyond the primary specialty are found to be significantly associated with the occurrence of symptoms of at least one disorder (p -value < 0.05). However, sex, number of working hours per day, number of working days per week, and shortage of hospital beds were not

statistically significantly associated with the occurrence of the disorders (p -value > 0.05).

As concerning the occurrence of PTSD, it is significantly associated (p -value < 0.05) with the position at a healthcare facility, encounter with physical threats (personal unsafety), dealing with a large number of IDPs, shortage of medical personnel, supplies, and hospital beds, as well as the necessity to perform job duties beyond the primary specialty.

Occurrence of depression is significantly associated (p -value < 0.05) with the position at a healthcare facility, professional experience, encounter with physical threats (personal unsafety), experience of treating severely wounded patients, dealing with a large number of IDPs,

Table 1

Working conditions during the full-scale war (N = 454)

Variable	Frequency. N	Percent. %
Working hours per day		
Less than 8 hours	246	54.2
8–12 hours	128	28.2
More than 12 hours	76	16.7
Working days per week		
1–4 days	70	15.4
5–6 days	351	77.3
6–7 days	32	7.0
Experience of physical threat / personal unsafety (missile attacks, artillery shelling, proximity to combat etc.)		
No	324	71.4
Yes	107	23.6
Difficult to answer	20	4.4
Experience of treating severely wounded patients (including due to war casualties)		
No	355	78.2
Yes	77	17.0
Difficult to answer	22	4.8
Experience of dealing with large numbers of IDPs		
No	167	36.8
Yes	257	56.6
Difficult to answer	29	6.4
Experience of shortage of medical personnel at the healthcare facility		
No	293	64.5
Yes	134	29.5
Difficult to answer	25	5.5
Experience of shortage of supplies at the healthcare facility		
No	372	81.9
Yes	58	12.8
Difficult to answer	22	4.8
Experience of shortage of hospital beds for the patients arriving at the healthcare facility		
No	284	62.6
Yes	101	22.2
Difficult to answer	68	15.0
Experience of performing job duties beyond the primary medical specialty		
No	351	77.3
Yes	79	17.4
Difficult to answer	21	4.6
Perceived increase in the workload during the full-scale war (0–10)		
Mean	6,0	

Table 2

Working conditions during the full-scale war (by regions) (N = 454)

Variable	Frequency/Percent	Frequency/Percent
Experience of physical threat / personal unsafety (missile attacks, artillery shelling, proximity to combat etc.)	Frontline regions (N = 134)	Other regions (N = 317)
No	33 (24.6%)	291 (91.8%)
Yes	92 (68.7%)	15 (4.7%)
Difficult to answer	9 (6.7%)	11 (3.5%)
Experience of treating severely wounded patients (including due to war casualties)	Frontline regions (N = 136)	Other regions (N = 318)
No	100 (73.5%)	255 (80.1%)
Yes	23 (16.9%)	54 (17%)
Difficult to answer	13 (9.6%)	9 (2.8%)
Experience of dealing with large numbers of IDPs	Frontline regions (N = 135)	Other regions (N = 318)
No	63 (46.7%)	104 (32.7%)
Yes	57 (42.2%)	200 (62.9%)
Difficult to answer	15 (11.1%)	14 (4.4%)
Experience of the shortage of medical personnel at the healthcare facility	Frontline regions (N = 135)	Other regions (N = 317)
No	59 (43.7%)	234 (73.8%)
Yes	69 (51.1%)	65 (20.5%)
Difficult to answer	7 (5.1%)	18 (5.7%)
Experience of the shortage of supplies at the healthcare facility	Frontline regions (N = 135)	Other regions (N = 317)
No	100 (74%)	272 (85.8%)
Yes	27 (20%)	31 (9.8%)
Difficult to answer	8 (5.9%)	14 (4.4%)
Shortage of hospital beds for the patients arriving at the healthcare facility	Frontline regions (N = 135)	Other regions (N = 318)
No	73 (54%)	211 (66.3%)
Yes	35 (25.9%)	66 (20.7%)
Difficult to answer	27 (20%)	41 (12.9%)
Experience of performing job duties beyond the primary medical specialty	Frontline regions (N = 133)	Other regions (N = 318)
No	91 (68.4%)	260 (81.7%)
Yes	36 (27%)	43 (13.5%)
Difficult to answer	6 (4.5%)	15 (4.7%)

shortage of medical personnel and supplies, as well as performing job duties beyond the primary specialty.

Finally, the occurrence of anxiety has been found significantly associated (p -value < 0.05) with the years of professional experience, encounter with physical threat (personal unsafety), experience of treating severely wounded patients, dealing with a large number of IDPs, shortage of medical personnel, as well as performing job duties beyond the primary specialty.

Managers and physicians are almost equally at risk of developing a disorder with the highest occurrence rates – 46.2% and 47.3%, respectively. Besides, it is young healthcare practitioners with little experience (who worked less than five years) who have demonstrated the highest occurrence rates of mental disorders – 59%. Women are more prone to the risk of depression and anxiety, and men are more at risk of developing PTSD. Yet these findings are not statistically significant (p -value > 0.05).

Encountering any of the work-related stressors included in the questionnaire led to an increased risk

of developing mental disorders. For instance, 46.2% of the healthcare professionals who experienced physical threat (personal unsafety) during work had symptoms of at least one disorder. The same is true for almost half of the respondents who treated severely wounded patients, dealt with many IDPs, experienced a shortage of medical personnel or supplies, and had to perform job duties beyond their primary medical specialty. At the same time, there has been no significant increase in the risk of developing mental disorders due to longer working hours or more working days per week.

As regards the occurrence of mental disorders depending on the regions respondents work in (frontline or other regions), the occurrence rates are considerably higher in the frontline regions. For instance, the occurrence of anxiety is twice as high in the frontline regions, while the occurrence of depression is almost three times as high. Still, the correlation between the place of work and the risk of occurrence of mental disorders was not found statistically significant (p -value > 0.05) except for PTSD (p -value < 0.05).

All the findings relating to the correlation between the variables included in the questionnaire and the risk of mental disorders (risk factors) are presented in Table 3 below.

Discussion of research results

As several studies consistently demonstrate that health-care practitioners who work under stressful conditions

Table 3

Correlation of variables and the risk of occurrence of mental disorders (risk factors) (N = 454)

Variable	Disorder occurrence rate			
	At least one disorder	PTSD	Depression	Anxiety
1	2	3	4	5
Sex	<i>p-value 0.316</i>	<i>p-value 0.208</i>	<i>p-value 0.488</i>	<i>p-value 0.056</i>
Male	16 (30.8%)	8 (15.4%)	16 (31.4%)	3 (5.8%)
Female	152 (37.9%)	39 (9.7%)	146 (36.3%)	63 (15.7%)
Position	<i>p-value 0.006</i>	<i>p-value 0.005</i>	<i>p-value 0.005</i>	<i>p-value 0.762</i>
Manager	12 (46.2%)	5 (18.5%)	12 (46.2%)	4 (14.8%)
Physician	69 (47.3%)	25 (17.1%)	67 (45.9%)	24 (16.6%)
Nurse	84 (31.9%)	16 (6.1%)	80 (30.4%)	37 (14.1%)
Intern	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other	3 (23.1%)	1 (7.7%)	3 (23.1%)	1 (7.7%)
Years of experience	<i>p-value 0.001</i>	<i>p-value 0.713</i>	<i>p-value 0.001</i>	<i>p-value 0.024</i>
Less than 5 years	36 (59.0%)	8 (13.3%)	35 (57.4%)	14 (23.0%)
5–10 years	12 (36.4%)	3 (9.1%)	12 (36.4%)	8 (24.2%)
More than 10 years	120 (33.4%)	36 (10.0%)	115 (32.0%)	44 (12.3%)
Working hours	<i>p-value 0.833</i>	<i>p-value 0.990</i>	<i>p-value 0.849</i>	<i>p-value 0.642</i>
Less than 8 hours	89 (36.2%)	26 (10.6%)	85 (34.7%)	32 (13.1%)
8–12 hours	48 (37.5%)	13 (10.2%)	48 (37.5%)	21 (16.4%)
More than 12 hours	30 (40.0%)	8 (10.7%)	28 (36.8%)	12 (15.8%)
Working days	<i>p-value 0.863</i>	<i>p-value 0.075</i>	<i>p-value 0.935</i>	<i>p-value 0.370</i>
1–4 days	24 (34.3%)	3 (4.3%)	24 (34.3%)	10 (14.3%)
5–6 days	132 (37.7%)	38 (10.8%)	127 (36.3%)	54 (15.4%)
6–7 days	12 (37.5%)	6 (18.8%)	11 (34.4%)	2 (6.3%)
Experience of physical threat / insecurity (missile attacks, artillery shelling, proximity to combat etc.)	<i>p-value 0.015</i>	<i>p-value 0.001</i>	<i>p-value 0.024</i>	<i>p-value 0.496</i>
No	108 (33.3%)	22 (6.8%)	105 (32.4%)	45 (13.9%)
Yes	49 (46.2%)	21 (19.8%)	46 (43.4%)	19 (17.9%)
Difficult to answer	11 (55.0%)	4 (20.0%)	11 (55.0%)	2 (10.0%)
Experience of treating severely wounded patients (including due to war casualties)	<i>p-value 0.011</i>	<i>p-value 0.172</i>	<i>p-value 0.024</i>	<i>p-value 0.012</i>
No	121 (34.2%)	32 (9.0%)	117 (33.1%)	44 (12.4%)
Yes	33 (42.9%)	11 (14.5%)	32 (41.6%)	15 (19.5%)
Difficult to answer	14 (63.6%)	4 (18.2%)	13 (59.1%)	7 (33.3%)
Experience of dealing with large numbers of IDP	<i>p-value 0.002</i>	<i>p-value- 0.003</i>	<i>p-value 0.003</i>	<i>p-value 0.050</i>
No	45 (26.9%)	7 (4.2%)	44 (26.3%)	16 (9.6%)
Yes	107 (41.8%)	37 (14.5%)	102 (39.8%)	46 (17.9%)
Difficult to answer	15 (51.7%)	3 (10.3%)	15 (51.7%)	3 (10.3%)
Experience of the shortage of medical personnel at the healthcare facility	<i>p-value 0.019</i>	<i>p-value 0.018</i>	<i>p-value 0.007</i>	<i>p-value 0.003</i>
No	94 (32.2%)	22 (7.5%)	89 (30.4%)	31 (10.6%)
Yes	62 (46.3%)	22 (16.5%)	61 (45.9%)	31 (23.1%)
Difficult to answer	10 (40.0%)	3 (12.0%)	10 (40.0%)	3 (12.0%)
Experience of the shortage of supplies at the healthcare facility	<i>p-value 0.001</i>	<i>p-value 0.001</i>	<i>p-value 0.001</i>	<i>p-value 0.134</i>
No	123 (33.1%)	28 (7.5%)	118 (31.7%)	48 (12.9%)
Yes	30 (52.6%)	13 (22.4%)	29 (50.9%)	10 (17.2%)
Difficult to answer	13 (59.1%)	6 (27.3%)	13 (59.1%)	6 (27.3%)

Continuation of Table 3

1	2	3	4	5
Shortage of hospital beds for the patients arriving at the healthcare facility	<i>p-value 0.106</i>	<i>p-value 0.048</i>	<i>p-value 0.079</i>	<i>p-value 0.097</i>
No	95 (33.5%)	23 (8.1%)	90 (31.8%)	34 (12.0%)
Yes	45 (45.0%)	17 (16.8%)	44 (43.6%)	21 (20.8%)
Difficult to answer	27 (39.7%)	7 (10.3%)	27 (39.7%)	10 (14.7%)
Experience of performing job duties beyond the primary medical specialty	<i>p-value 0.002</i>	<i>p-value 0.001</i>	<i>p-value 0.001</i>	<i>p-value 0.003</i>
No	114 (32.6%)	26 (7.4%)	109 (31.1%)	41 (11.7%)
Yes	42 (53.2%)	18 (22.8%)	41 (52.6%)	21 (26.6%)
Difficult to answer	10 (47.6%)	3 (14.3%)	10 (47.6%)	(14.3%)

are at risk of developing mental disorders, the main aim of this survey was to establish the scope of this problem in Ukraine during the period of full-scale war to develop respective practical recommendations.

Of the 454 study participants, more than one-third (37%) have demonstrated symptoms of either PTSD, depression, or anxiety. This confirms the hypothesis that healthcare practitioners exposed to war-related stress would have higher rates of mental disorders as compared to the general population (the average reference rates for the mentioned disorders among the general population are laid down in para. 1.2 of the study). Besides, we found that 10.4% of the respondents manifested symptoms of PTSD, which is in line with the findings of previous studies exploring the impact of war-related and other stressors on the mental health of healthcare personnel. Namely, such studies found that the occurrence rate of PTSD among healthcare professionals amounted to 14.8%, ranging between as low as 4.4% and as high as 28%, depending on various factors [7]. The occurrence rates of depression (35.7%) and anxiety (14.5%) established among the healthcare professionals within this study also correspond to the figures presented in the literature. For instance, approximately one-third of healthcare professionals prone to various stressors manifested depressive symptoms according to a range of studies [8–10].

It is worth noting that although the predominant number of the respondents of our study allegedly have mild depression (67.9%), almost 13% of them have symptoms of moderately severe or even severe depression, which indicates the seriousness of the problem and requires respective interventions.

The survey has also confirmed our second hypothesis, suggesting that the prevalence of mental disorders would be higher for healthcare workers employed in the hospitals located in the regions close to the frontline as compared to the healthcare workers practicing in other regions. All the investigated disorders were found to be considerably more widespread among healthcare personnel working in frontline hospitals than among those employed in relatively safe regions of Ukraine. May be explained by the fact that it is the frontline specialized medical care facilities that take on the primary responsibility for treating patients with severe casualties and work

under extreme conditions in very dangerous settings close to the battlefield.

Our study also aimed to consider the risk factors impacting the development of mental disorders among healthcare workers. Statistically significant correlation has been established between the position of healthcare professionals and their risk of developing mental disorders. Since managers and physicians demonstrated considerably higher rates of mental disorders, we assume that the occurrence risk may be related to the scope of professional responsibility, i.e., the more responsibility a practitioner bears, the higher the risk of developing a disorder they are prone to. It is worth noting that these findings do not correspond to the findings of the other previous studies, which demonstrated that nurses were usually at a higher risk of mental disorders than physicians [11]. Such a difference may be due to the peculiarities of the investigated settings, as the current situation in Ukraine may place a particularly heavy burden on managers and physicians responsible for the overall organization of healthcare service provision during the crisis.

Besides, young healthcare professionals have been found considerably more prone to the risk of developing mental disorders than their more experienced colleagues – more than half of young professionals manifested symptoms of at least one disorder. These findings are consistent with the existing research evidence, as several works included young age among the risk factors for mental disorders among healthcare professionals [12; 13]. This is explained by the fact that younger practitioners may have fewer coping strategies and less experience of overcoming crises than their more experienced colleagues.

At the same time, we found no correlation between the increased workload (as assessed in several working days per week and several working hours per day) and the risk of developing mental disorders. Such resilience under increased workload may be due to experience dealing with COVID-19, when the healthcare system was under extreme strain [14; 15]. Hence, healthcare workers in Ukraine might have become considerably more resistant to the increased workload and do not perceive it as a serious stressor.

Overall, the study's findings are largely consistent with the existing literature on the mental health of healthcare practitioners working under stressful conditions.

Prospects for further research

The full-scale invasion of Ukraine has exacerbated problems regarding the mental health of Ukrainians, including medical workers.

Factors affecting the mental health of conflict-affected populations remain poorly understood, both at the population level and on occupational grounds.

The problematic issues and the research results presented in the article indicate the need to develop and use effective management tools for assessing the mental health of medical personnel, as well as the range of information, organizational, and psychological support measures that must be implemented in the workplace.

Conclusions

The results of the survey carried out in eight hospitals located in four regions in Ukraine, which are differently positioned concerning the impact of the war, demonstrated quite high occurrence rates of PTSD, anxiety, and depression among the respondent healthcare staff. Among the 454 study participants, more than one-third (37%) have

demonstrated symptoms of at least one of the disorders mentioned. These findings are consistent with the available evidence stating that healthcare practitioners exposed to war-related stress have higher rates of mental disorders as compared to the general population.

Depression is the most widespread disorder among the respondents, amounting to 37% of them, with almost 13% of them having symptoms of moderately severe or even severe depression, which indicates the seriousness of the problem and requires respective interventions.

The results of the study demonstrated the widespread impact of war-related stress on the mental health of medical personnel working in Ukraine: more than a third of medical workers had symptoms of post-traumatic stress disorder, depression, or anxiety.

It was found that the prevalence of mental disorders was higher among health professionals employed in hospitals located in regions close to the front line compared to health professionals practicing in other regions.

Several risk factors have been identified that increase the likelihood of developing mental disorders, including young age, responsibility at work, difficulties associated with war during work, etc.

Bibliography

1. Bentz L, Vandentorren S, Fabre R, Bride J, Pirard P, Doulet N, et al. Mental health impact among hospital staff in the aftermath of the Nice 2016 terror attack: the ECHOS de Nice study. *BMC Public Health*. 2021;21(1). DOI: <https://doi.org/10.1186/s12889-021-11438-9>.
2. Bou-Karroum L, El-Harakeh A, Kassamany I, Ismail H, Arnaout NE, Charide R, et al. Health care workers in conflict and post-conflict settings: Systematic mapping of the evidence. *PLoS One*. 2020;15(5):e0233757. DOI: <https://doi.org/10.1371/journal.pone.0233757>.
3. D'Ettorre G, Pellicani V, Ceccarelli G. Post-traumatic stress disorder symptoms in healthcare workers: a ten-year systematic review. *Acta Biomed*. 2020;91. DOI: <https://doi.org/10.23750/abm.v91i12-s.9459>.
4. Xiao X, Zhu X, Fu S, Hu Y, Li X, Xiao J. Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: A multi-center cross-sectional survey investigation. *J Affect Disord*. 2020;274:405–10. DOI: <https://doi.org/10.1016/j.jad.2020.05.081>.
5. Zace D, Hoxhaj I, Orfino A, Viteritti A, Janiri L, Di Pietro M. Interventions to address mental health issues in healthcare workers during infectious disease outbreaks: A systematic review. *J Psychiatr Res*. 2021;136:319–33. DOI: <https://doi.org/10.1016/j.jpsychires.2021.02.019>.
6. Plummer F, Manea L, Trépel D, McMillan D. Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic meta-analysis. *Gen Hosp Psychiatry*. 2016;39:24–31. DOI: <https://doi.org/10.1016/j.genhosppsych.2015.11.005>.
7. Sandler DJ, Rutkowska A, Makara-Studzińska M. How the exposure to trauma has hindered physicians' capacity to heal: prevalence of PTSD among healthcare workers. *Eur J Psychiatry*. 2016;30(4):321–34. Available from: <https://scielo.isciii.es/pdf/ejpen/v30n4/original06.pdf>.
8. Abraham A, Chaabna K, Doraiswamy S, Bhagat S, Sheikh JI, Mamtani R, et al. Depression among healthcare workers in the Eastern Mediterranean Region: a systematic review and meta-analysis. *Hum Resour Health*. 2021;19(1). DOI: <https://doi.org/10.1186/s12960-021-00628-6>.
9. Fond G, Fernandes S, Lucas G, Greenberg N, Boyer L. Depression in healthcare workers: Results from the nationwide AMADEUS survey. *Int J Nurs Stud*. 2022;135:104328. DOI: <https://doi.org/10.1016/j.ijnurstu.2022.104328>.
10. Aziz GS, ALghfari S, Bogami E, Abduljwad K, Bardisi WM. Prevalence and determinants of depression among primary healthcare workers in Jeddah, Saudi Arabia 2020. *J Fam Med Prim Care*. 2022;11(6):3013. DOI: https://doi.org/10.4103/jfmpe.jfmpe_2215_21.
11. Khanal P, Devkota N, Dahal M, Paudel K, Joshi D. Mental health impacts among health workers during COVID-19 in a low-resource setting: a cross-sectional survey from Nepal. *Glob Health*. 2020;16(1). DOI: <https://doi.org/10.1186/s12992-020-00621-z>.
12. D'Ettorre G, Ceccarelli G, Santinelli L, Vassalini P, Pietro Innocenti G, Alessandri F, et al. Post-traumatic stress symptoms in healthcare workers dealing with the COVID-19 pandemic: A systematic review. *Int J Environ Res Public Health*. 2021;18(2):601. DOI: <https://doi.org/10.3390/ijerph18020601>.
13. Elhadi M, Msherghi A, Elgzairi M, Alhashimi A, Bouhuwaish A, Biala M, et al. Psychological status of healthcare workers during the civil war and COVID-19 pandemic: A cross-sectional study. *J Psychosom Res*. 2020;137:110221. DOI: <https://doi.org/10.1016/j.jpsychores.2020.110221>.
14. Lim ICZ, Tam WW, Chudzicka-Czupala A, McIntyre RS, Teopiz KM, Ho RC, et al. Prevalence of depression, anxiety and post-traumatic stress in war- and conflict-afflicted areas: A meta-analysis. *Front Psychiatry*. 2022;13:978703. DOI: <https://doi.org/10.3389/fpsy.2022.978703>.

References

1. Bentz L, Vandentorren S, Fabre R, Bride J, Pirard P, Doulet N, et al. Mental health impact among hospital staff in the aftermath of the Nice 2016 terror attack: the ECHOS de Nice study. *BMC Public Health*. 2021;21(1). <https://doi.org/10.1186/s12889-021-11438-9>.
2. Bou-Karroum L, El-Harakeh A, Kassamany I, Ismail H, Arnaout NE, Charide R, et al. Health care workers in conflict and post-conflict settings: Systematic mapping of the evidence. *PLoS One*. 2020;15(5):e0233757. <https://doi.org/10.1371/journal.pone.0233757>.
3. D'Ettorre G, Pellicani V, Ceccarelli G. Post-traumatic stress disorder symptoms in healthcare workers: a ten-year systematic review. *Acta Biomed*. 2020;91. <https://doi.org/10.23750/abm.v91i12-s.9459>.
4. Xiao X, Zhu X, Fu S, Hu Y, Li X, Xiao J. Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: A multi-center cross-sectional survey investigation. *J Affect Disord*. 2020;274:405–10. <https://doi.org/10.1016/j.jad.2020.05.081>.
5. Zace D, Hoxhaj I, Orfino A, Viteritti A, Janiri L, Di Pietro M. Interventions to address mental health issues in healthcare workers during infectious disease outbreaks: A systematic review. *J Psychiatr Res*. 2021;136:319–33. <https://doi.org/10.1016/j.jpsy-chires.2021.02.019>.
6. Plummer F, Manea L, Trépel D, McMillan D. Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic meta-analysis. *Gen Hosp Psychiatry*. 2016;39:24–31. <https://doi.org/10.1016/j.genhosppsych.2015.11.005>.
7. Sandler DJ, Rutkowska A, Makara-Studzinska M. How the exposure to trauma has hindered physicians' capacity to heal: prevalence of PTSD among healthcare workers. *Eur J Psychiatry*. 2016;30(4):321–34. Available from: <https://scielo.isciii.es/pdf/ejpen/v30n4/original06.pdf>.
8. Abraham A, Chaabna K, Doraiswamy S, Bhagat S, Sheikh JI, Mamtani R, et al. Depression among healthcare workers in the Eastern Mediterranean Region: a systematic review and meta-analysis. *Hum Resour Health*. 2021;19(1). <https://doi.org/10.1186/s12960-021-00628-6>.
9. Fond G, Fernandes S, Lucas G, Greenberg N, Boyer L. Depression in healthcare workers: Results from the nationwide AMADEUS survey. *Int J Nurs Stud*. 2022;135:104328. <https://doi.org/10.1016/j.ijnurstu.2022.104328>.
10. Aziz GS, ALghfari S, Bogami E, Abduljwad K, Bardisi WM. Prevalence and determinants of depression among primary healthcare workers in Jeddah, Saudi Arabia 2020. *J Fam Med Prim Care*. 2022;11(6):3013. https://doi.org/10.4103/jfmpe.jfmpe_2215_21.
11. Khanal P, Devkota N, Dahal M, Paudel K, Joshi D. Mental health impacts among health workers during COVID-19 in a low-resource setting: a cross-sectional survey from Nepal. *Glob Health*. 2020;16(1). <https://doi.org/10.1186/s12992-020-00621-z>.
12. D'Ettorre G, Ceccarelli G, Santinelli L, Vassalini P, Pietro Innocenti G, Alessandri F, et al. Post-traumatic stress symptoms in healthcare workers dealing with the COVID-19 pandemic: A systematic review. *Int J Environ Res Public Health*. 2021;18(2):601. <https://doi.org/10.3390/ijerph18020601>.
13. Elhadi M, Msherghi A, Elgzairi M, Alhashimi A, Bouhuwaish A, Biala M, et al. Psychological status of healthcare workers during the civil war and COVID-19 pandemic: A cross-sectional study. *J Psychosom Res*. 2020;137:110221. <https://doi.org/10.1016/j.jpsychores.2020.110221>.
14. Lim ICZ, Tam WW, Chudzicka-Czupala A, McIntyre RS, Teopiz KM, Ho RC, et al. Prevalence of depression, anxiety and post-traumatic stress in war- and conflict-afflicted areas: A meta-analysis. *Front Psychiatry*. 2022;13:978703. <https://doi.org/10.3389/fpsy.2022.978703>.

Purpose is to investigate the prevalence of symptoms of certain mental disorders among healthcare workers who have been exposed to war-related stress in Ukraine.

Materials and Methods. The study was conducted among healthcare workers employed at 8 civilian medical facilities in the Donetsk, Dnipropetrovsk, Poltava, and Zakarpattia regions of Ukraine (a total of 454 participants). A cross-sectional research design was used for this study. The mental health assessment included questionnaires based on the PCL-5, PHQ-9, and GAD-7 scales, providing a comprehensive approach to assessing respondents' psychological well-being.

Results. The results of a survey of healthcare workers at eight medical facilities located in four regions of Ukraine revealed relatively high prevalence rates of PTSD, anxiety, and depression among respondents. Specifically, among the 454 study participants, more than a third (37%) of respondents reported symptoms of at least one of these disorders. This may indicate that healthcare workers who have experienced war-related stress have higher rates of mental health disorders compared to the general population. Depression is the most common disorder among respondents (37%). Nearly 13% of respondents had symptoms of moderate or even severe depression.

Conclusions. The study results demonstrated a significant impact of war-related stress on the mental health of medical personnel working in Ukraine: more than a third of healthcare workers exhibited symptoms of post-traumatic stress disorder, depression, or anxiety. The prevalence of mental disorders was higher among healthcare workers employed in hospitals located in regions near the front lines compared to healthcare workers working in other regions.

Key words: mental health, healthcare personnel, war, post-traumatic stress disorder (PTSD), depression, anxiety, professional burnout.

Мета – вивчити поширеність симптомів окремих психічних розладів серед медичних працівників, які зазнали впливу стресу, пов'язаного з війною в Україні.

Матеріали та методи. Дослідження проводилося серед медичних працівників, які працювали у 8 цивільних медичних закладах у Донецькій, Дніпропетровській, Полтавській та Закарпатській областях України (N=454). У дослідженні застосовано крос-секційний дизайн. Оцінювання психічного здоров'я респондентів здійснювали із використанням стандартизованих психодіагностичних інструментів: шкали посттравматичного стресового розладу PCL-5, опитувальника депресії PHQ-9 та

шкали генералізованого тривожного розладу GAD-7. Такий підхід забезпечив комплексну оцінку наявності та вираженості симптомів ПТСР, депресії та тривожних розладів серед учасників дослідження.

Результати. Результати опитування серед медичних працівників із 8 закладів охорони здоров'я, розташованих у чотирьох регіонах України, засвідчили високий рівень поширеності ПТСР, тривожних розладів та депресії серед респондентів.

Серед 454 учасників дослідження 37% повідомили про наявність симптомів щонайменше одного із зазначених психічних розладів. Отримані дані можуть свідчити, що медичні працівники, які зазнали стресу, пов'язаного з війною, мають вищий ризик розвитку психічних розладів порівняно із загальною популяцією.

Найбільш поширеним психічним розладом серед респондентів виявилася депресія, симптоми якої були зафіксовані у 37% опитаних. Водночас майже 13% респондентів мали симптоми депресії середнього або важкого ступеня, що свідчить про значну вираженість проблеми та потребу у впровадженні відповідних психосоціальних і медичних втручань.

За результатами проведеного дослідження встановлено, що симптоми посттравматичного стресового розладу (ПТСР) виявлено у 10,4% респондентів, що узгоджується з даними міжнародних досліджень щодо впливу воєнних та інших стресогенних чинників на психічне здоров'я медичних працівників. Зокрема, за даними D. Sandler та співавт., поширеність ПТСР серед медичних працівників становила 14,8%.

Частота депресії (35,7%) та тривоги (14,5%), встановлена серед медичних працівників у рамках нашого дослідження, також відповідає результатам, представленим у сучасній науковій літературі.

У ході дослідження встановлено статистично значущий зв'язок між виникненням симптомів щонайменше одного психічного розладу та такими чинниками, як: посада, професійний досвід, наявність загрози фізичній безпеці під час виконання професійних обов'язків, досвід надання медичної допомоги пацієнтам, які постраждали внаслідок воєнних дій, робота зі значною кількістю внутрішньо переміщених осіб (ВПО), а також необхідність виконання службових обов'язків поза межами основної спеціалізації ($p < 0,05$).

Щодо розвитку симптомів ПТСР встановлено статистично значущий вплив таких чинників, як: посада, наявність загрози особистій безпеці, робота зі значною кількістю ВПО, підвищене робоче навантаження, а також необхідність виконання службових обов'язків поза межами основної спеціалізації ($p < 0,05$).

За даними дослідження встановлено, що жінки виявили більшу схильність до ризику розвитку депресії та тривожних розладів, тоді як у чоловіків частіше спостерігався ризик розвитку ПТСР. Проте виявлені відмінності не досягли рівня статистичної значущості ($p > 0,05$).

Результати дослідження засвідчили, що наявність симптомів депресії серед респондентів була статистично значущо пов'язана ($p < 0,05$) із займаною посадою, професійним стажем, наявністю загрози особистій безпеці під час виконання професійних обов'язків, наданням медичної допомоги пацієнтам з воєнними травмами та ВПО, необхідністю виконання службових обов'язків поза межами основної спеціалізації.

Водночас встановлено, що розвиток тривожних розладів був статистично значущо пов'язаним ($p < 0,05$) із такими чинниками, як: стаж роботи, наявність загрози особистій безпеці під час виконання професійних обов'язків, досвід надання медичної допомоги пацієнтам з воєнними травмами.

Висновки. Результати проведеного дослідження засвідчили суттєвий вплив воєнного стресу на психічне здоров'я медичних працівників в Україні: понад третина респондентів мали симптоми посттравматичного стресового розладу (ПТСР), депресії або тривоги.

Встановлено, що поширеність психічних розладів була вищою серед медичних працівників, які працювали у закладах охорони здоров'я, розташованих у прифронтових областях, порівняно з медичними працівниками інших регіонів країни.

Ідентифіковано низку чинників ризику, асоційованих із підвищеною ймовірністю розвитку психічних розладів, серед яких – молодий вік, високий рівень професійного навантаження, наявність труднощів, пов'язаних із виконанням службових обов'язків в умовах війни, а також інші стресогенні фактори професійної діяльності.

Ключові слова: психічне здоров'я, медичні працівники, війна, посттравматичний стресовий розлад (ПТСР), депресія, тривожний розлад, професійне вигорання.

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Information about the authors

Kostetska Olha Olehivna – Graduate of the Master's Program at the School of Public Health, National University of Kyiv-Mohyla Academy; Hryhoriya Skovorody Str., 2, Kyiv, Ukraine, 04070; Knowledge Management, Capacity Development and M&E Expert, Swiss Tropical and Public Health Institute (Swiss TPH), Trauma Rehabilitation for Ukraine Project.
ORCID ID: 0009-0007-5291-2078 ^{B, C}

Yurochko Tetyana Petrivna – PhD in Public Administration, Associate Professor, Head of the School of Public Health, National University of Kyiv-Mohyla Academy; Hryhoriya Skovorody Str., 2, Kyiv, Ukraine, 04070.
t.yurochko@ukma.edu.ua, ORCID ID: 0000-0002-9455-9141 ^{A, F}

Shevchenko Marina Viktorivna – Doctor of Medical Sciences, Senior Researcher, Professor at the School of Public Health, National University of Kyiv-Mohyla Academy; Hryhoriya Skovorody Str., 2, Kyiv, Ukraine, 04070.
m.shevchenko@ukma.edu.ua, ORCID ID: 0000-0003-1828-8447 ^{A, D, E}

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