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## Mental Health of Healthcare Workers during COVID-19 Pandemic in Ukraine

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# ОРИГІНАЛЬНІ ДОСЛІДЖЕННЯ: КЛІНІЧНІ НАУКИ

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## Стан психічного здоров'я медичних працівників під час пандемії COVID-19 в Україні

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**Вступ.** Під час пандемії COVID-19 медичні працівники відчувають сильний професійний та психоемоційний стрес, що створює для них високий ризик виникнення психічних порушень. Метою дослідження було вивчення стану психічного здоров'я медичних працівників, які надавали допомогу хворим на COVID-19.

**Матеріал та методи.** З використанням комплексу психодіагностичних шкал, для оцінки симптомів депресії (PHQ-9), тривоги (GAD-7), безсоння (ISI) та впливу травматичної події на психоемоційний стан (IES-R) проведено онлайн опитування 500 медичних працівників з усіх регіонів України з 04.04.2021 р. по 29.05.2021 р. Здійснено порівняльне дослідження за соціо-демографічними характеристиками та показниками психодіагностичних шкал двох груп спеціалістів, що надавали (n=441) або не надавали (n=40) допомогу хворим на COVID-19.

**Результати.** У значної кількості медичних працівників обох груп спостерігалися симптоми психічних порушень, що свідчить про негативний вплив пандемії COVID-19 на стан їхнього психічного здоров'я. Разом з тим, в групі медичних спеціалістів, які надавали допомогу хворим на COVID-19, спостерігалися більш виражені симптоми депресії (p = 0.010), тривоги (p = 0.010), порушення сну (p = 0.018) у порівнянні з групою спеціа-

## Mental Health of Healthcare Workers during COVID-19 Pandemic in Ukraine

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**Introduction.** Health care professionals experience severe occupational and psycho-emotional stress during the COVID-19 pandemic, which put them at high risk of mental disorders. The aim of the study was to examine the mental health of healthcare workers who provided treatment and support to patients with COVID-19.

**Materials and methods.** A set of standardized psycho-diagnostic scales to assess the symptoms of depression (PHQ-9), anxiety (GAD-7), insomnia (ISI) and the impact of traumatic events on psycho-emotional state (IES-R) was used for an online survey of healthcare professionals from all regions of Ukraine during 04/04/2021 to 05/29/2021. A comparative study was conducted comparing two groups of specialists who provided (n = 441) or who did not support (n = 40) patients with COVID-19 on socio-demographic characteristics and indicators of psycho-diagnostic scales.

**Results.** In total 500 staff were invited to take part in this survey. A significant number of health workers in both groups experienced symptoms of mental disorders, indicating the negative impact of the COVID-19 pandemic on their mental health. However, in the group of medical professionals who provided care to patients with COVID-19, there were more pronounced symptoms of depression (p = 0.010), anxiety (p = 0.010), sleep disturbances (p = 0.018) compared with the group of specialists who did not provide direct care to COVID-19 patients. Statistically significant differences were also obtained on the IES-R scale: subscales "avoidance" (p = 0.048), "intrusion" (p = 0.021), "hyperarousal" (p = 0.035).

**Conclusions.** Healthcare professionals who care for COVID-19 patients have a significantly increased risk of

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лістів, які безпосередньо допомогу хворим не надавали. За шкалою IES-R також отримано статистично значущі відмінності: субшкала «уникнення» ( $p = 0.048$ ), «інтрузії» ( $p = 0.021$ ), «гіперзбудження» ( $p = 0.035$ ).

**Висновки.** Медичні працівники, які надають допомогу хворим на COVID-19, мають значно вищий ризик виникнення порушень психічного здоров'я та потребують особливої уваги і розробки спеціальних програм психологічної підтримки та психіатричної допомоги.

**Ключові слова:** COVID-19, психічне здоров'я, медичні працівники, депресія, тривога, порушення сну.

**Introduction.** In respect of the global COVID-19 crisis, health workers bear the brunt of the pandemic. Due to mental and physical burnout, separation from families, stigma, fear of infecting themselves or their loved ones, and distress of potentially losing patients and colleagues, they are exposed to prolonged stress. Catastrophic effects such as burnout, insomnia, post-traumatic stress disorder, anxiety, depression and obsessive-compulsive symptoms have been reported in healthcare professionals treating patients with COVID-19 [1, 2]. Some authors also attribute the mental health problems of medical personnel during a pandemic to prolonged asthenia with cognitive impairment [3, 4].

Previous experience of studying the long-term consequences of the H1N1, SARS and Ebola epidemics has shown that the psycho-emotional condition of health workers suffers both during and after the pandemic and requires special effort to ensure the mental health of health care staff themselves [5]. The prevalence of post-traumatic stress disorder among medical personnel during the SARS outbreak in 2003, for example, was 20 percent [6, 7]. A 2014 study of the mental health of health workers for Ebola patients also found a number of frequent mental and behavioral disorders, the most common of which were anxiety, depression and post-traumatic stress disorder [8].

Recently, there has been a growing number of reports of mental health disorders in the context of the COVID-19 pandemic [9, 10]. In order to determine the level of psychological problems in medical staff in the context

of the COVID-19 pandemic, online surveys have been conducted in a number of countries [11-16]. The spread of SARS-CoV-2 has been identified as a major stressor for health care workers, and the many effects of the pandemic have had a negative impact on the state of the mental health. In Ukraine, such a study was conducted for the first time from 03/30/2020 to 04/21/2020 by the Institute of Psychiatry of Taras Shevchenko National University of Kyiv [17]. Using a specially designed questionnaire, an online survey of 1,100 health workers from all regions of Ukraine was conducted, the characteristics of health workers' response to the COVID-19 situation were identified, and stress-related emotional and behavioral factors relevant to respondents were recorded [18].

The aim of this study was to examine the mental health of health care workers who provided care to patients with COVID-19 in Ukraine.

**Materials and methods.** A cross-sectional descriptive study was conducted from 04/04/2021 until 05/29/2021. The survey of 500 healthcare workers in all regions of Ukraine was conducted using a specially developed online questionnaire. The questionnaire was composed of two parts: socio-demographic characteristics and a set of psycho-diagnostic scales. The socio-demographic characteristics were measured through gender, age, marital status, the presence of children, type of residence, place of work, department, position, work experience, contact with COVID-19 patients, number of COVID-19 patients treated, testing for COVID-19, vaccination against COVID-19, COVID-19 disease, the need for



mental health problems and require particular attention and the development of special programs of psychological support and psychiatric care.

**Key words:** COVID-19, mental health, healthcare workers, depression, anxiety, sleep disorders.

professional psychological support, and measures for psychological assistance. The following tools were used to assess the severity of symptoms of mental disorders: the 9-item Patient Health Questionnaire (PHQ-9) to measure the symptoms of depression [19], the 7-item Generalized Anxiety Disorder Scale (GAD-7) [20], the 7-item Insomnia Severity Index (ISI) [21], the Impact of Events Scale - Revised (IES-R) to measure subjective distress caused by traumatic events [22].

Descriptive statistics were used to illustrate socio-demographic indicators and to distribute estimates of answers to questions. Pearson's criterion  $\chi^2$  was applied to compare group differences in categorical variables (socio-demographic characteristics). The nonparametric Mann-Whitney U-test was used to compare the results of scales in groups of respondents and the quantitative indicators. The size of the effect was calculated as a rank-biserial correlation [25]. A  $p < 0.05$  value was considered statistically significant. The results of the study were processed using "RStudio" software with R 4.0.5 "Shake and Throw" software language.

All procedures were conducted in accordance with the ethical standards of The Declaration of Helsinki (1964) and its amendments. Study participation was voluntary and it was conducted without any intervention, meaning that it involved no more than minimal risk. All the study subjects provided written informed consent while completing the questionnaire and the study was approved by the ethics committee of the Institute of Psychiatry of Taras Shevchenko National University of Kyiv.

Among the 500 respondents, the majority were female medical workers (82.4%). The average age of the respondents was  $40.77 \pm 11.90$  years, the average length of service was  $16.21 \pm 11.46$  years. 66.2% of health workers were married, 5% – in civil partnership, 15.2% – were single, and 9.8% were divorced. Almost a third of the respondents were

general practitioners. The main place of work for 28.2% respondents were centers and outpatient clinics of primary health care, 40.4% worked in inpatient medical institutions, 4.2% in infectious diseases hospitals, and 27.2% in other medical institutions. Among them are 59.6% doctors, 3.6% – heads of health care institutions, 9.8% – heads of departments, 17.8% – nurses, 1% – junior nurses, 8.2% held other positions. The majority of respondents (59.2%) had been infected with COVID-19. 69.4% of respondents reported testing for COVID-19 at the health facility where they work. At the time of completing the questionnaire, 38.8% of health workers have received their COVID-19 vaccination.

**Results.** Altogether, 500 health workers took part in the survey, and 481 respondents were selected for further statistical analysis, as 19 did not answer all the questions on the scales. The group of health workers providing direct care to COVID-19 patients consisted of 441 people (group A), group B consisted of 40 physicians who did not provide such care.

The average age and work experience of the respondents of group A was statistically significantly higher than that of the medical workers of group B (Table 1). There was no difference in other socio-demographic characteristics (Table 2) between the two groups of the respondents.

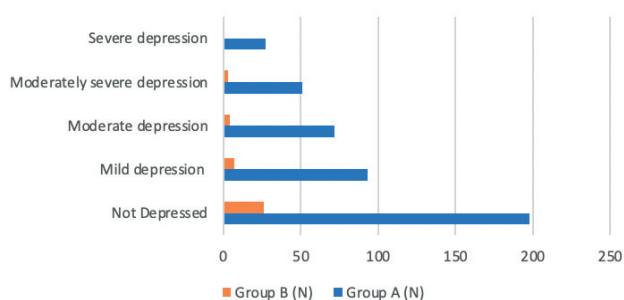
Among the characteristics of the respondents' professional activity, a significant difference between the two groups was found only in relation to the health care institution in which they worked and the position held: in group A there were significantly more primary care doctors and nurses ( $p = 0.000$ ) (Table 3).

The level of testing and vaccination of employees from COVID-19 was approximately the same in both groups. In addition, the percentage of COVID-19 patients among group A health workers was significantly higher than in

group B ( $p = 0.035$ ). Healthcare workers who looked after COVID-19 patients were much more likely to need professional psychological support than specialists who did not provide such care ( $p = 0.000$ ). At the same time, the vast majority of respondents in both groups (92.1% and 90.0%) indicated a lack of mental health support in their institution.

The state of mental health of health workers was assessed using the scales PHQ-9, GAD-7, IES-R, ISI (Table 4, 5). Comparative analysis identified a statistically significant difference between groups A and B on all scales. This indicates a much greater severity of mental health symptoms in health care workers who provided direct care to COVID-19 patients (Table 6). Clinically significant signs of depression were observed in most specialists in this group. Depression of moderate and moderate severity was observed in 27.89% of cases, mild depression – in 21.09%, severe depression – in 6.12% of people (Figure 1).

Severity of depression (PHQ-9) in groups A and B

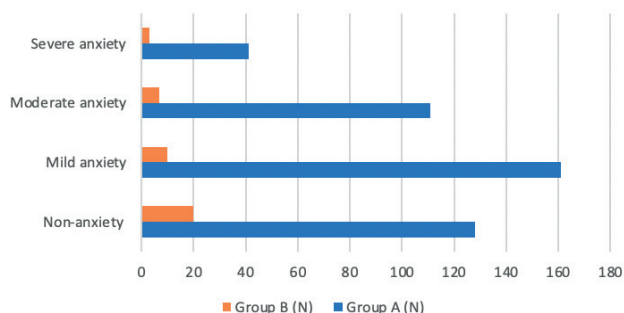


Even more pronounced differences were observed in group A according to the GAD-7 scale. Clinically significant signs of anxiety were observed in more than 70% of specialists. A quarter of respondents felt moderate anxiety, and one in ten health workers experienced severe anxiety (Figure 2).

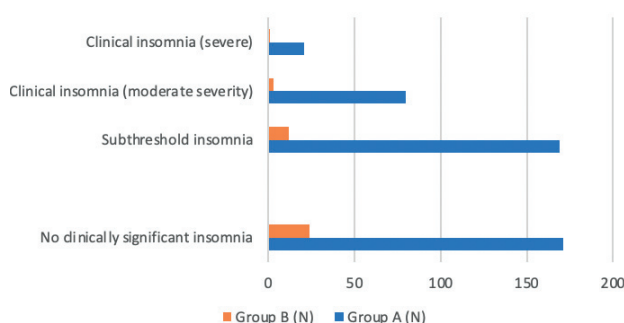
Nearly two-thirds of health care workers in this group reported symptoms of sleep disturbances. The share of cases with moderate sleep disorders was significant (18.14%), with a further and 4.76% of health workers reported severe sleep disorders (Figure 3).

The level of subjective distress caused by traumatic events in most health workers who directly cared for patients with COVID-19 was within the

Severity of anxiety (GAD-7) in groups A and B



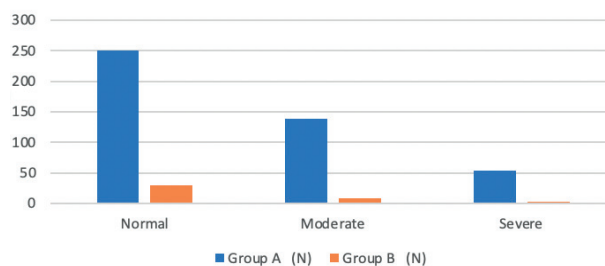
Severity of insomnia (ISI) in groups A and B



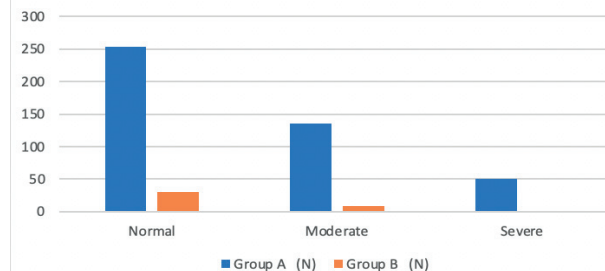
normal range. Moderate distress was observed in approximately one third of cases on all subscales, and the severity ranged from 4.54% on the subscale "hyperarousal" to 12.02% on the scale of "avoidance" (Figure 4, 5, 6).

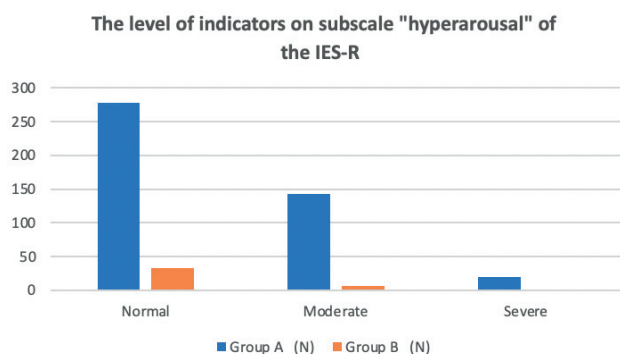
Clinically significant signs of depression were not

The level of indicators on subscale "avoidance" of the IES-R



The level of indicators on subscale "intrusions" of the IES-R





found in most Group B specialists. Severe, moderate, or mild depression was reported in 35% of health care providers. Also, the vast majority of respondents in this group did not show clinically significant symptoms of anxiety. Half of the health workers said they did not feel anxious at all. 60% of Group B specialists did not report sleep disturbances. Other respondents had mild to moderate sleep disorders, and only one had severe sleep disturbances. The vast majority of health care professionals who did not care for patients with COVID-19 did not experience distress. Only one respondent on the Intrusion subscale and 2 respondents on the Avoidance subscale had severe distress.

**Discussion.** The results of our study showed that the group of health workers who directly provided care to patients with COVID-19 had more severe symptoms of depression, anxiety, sleep disorders and subjective distress compared with the group of specialists who did not provide such care.

The results obtained by us largely coincide with the results of other international publications on clinical forms of mental disorders in health workers during the COVID-19 pandemic [24, 25]. Thus, according to the results of a systematic review of 65 studies involving 97,333 health workers from 21 countries, the prevalence of depression among medical staff was 21.7%, anxiety disorder – 22.1%, post-traumatic stress disorder – 21.5% [26].

Our survey of health care workers who provided direct care to patients with COVID-19 found that they had symptoms of mental disorders of varying severity, namely depression (55.10%), anxiety (70.80%), sleep disorders (61.22%), sub-syndromal distress (43.31%, 42.40%, 36.92% on the IES-R sub scales).

A survey of health professionals in north-eastern Italy [27] found that a significant proportion of participants had clinically significant symptoms of post-traumatic stress disorder (54%), anxiety (50%) and depression (27%). These results for depression are consistent with other literature on the presence of depressive symptoms in healthcare workers during the COVID-19 pandemic – 23% [28], 25% [29], 37% [30, 31]. In contrast, in other studies, the prevalence of depression was 58.2% [32], 77.6% [33], 64.7% [34] and it was comparable to our results. The reasons for such differences may be the difference in the sample size, time of the study, and the features of the screening tools.

According to our study, the proportion of health workers with symptoms of anxiety (70.80%) was significantly higher than that reported by S. Pappa et al. [28]. J. Lai et al. [31] reported that in January-February 2020, 44.6% of doctors and nurses who took care of COVID-19 patients had symptoms of anxiety. The intensity of symptoms was found in nurses compared to other categories of health professionals and in persons who provided direct care to COVID-19 patients. The prevalence symptoms of anxiety in our study participants accords with the results of a survey of medical staff provided by K. Young et al. (mild anxiety – 31%, clinically significant anxiety – 33%, total – 64% of health professionals) [35] and Y. Li et al. (64.7%) [26].

One of the key indicators of the mental health of medical staff is the quality of sleep. In a study by Elkholy H. et al. [36], 69.5% of respondents reported sleep disturbances, which similar to our findings (61.22%). Authors Y. Huang & N. Zhao [32] indicated that almost one in four healthcare professionals who looked after COVID-19 patients had trouble sleeping.

Post-traumatic stress disorder in healthcare professionals who care for patients with COVID-19 deserves special attention, as the impact of traumatic experiences can have significant long-term consequences for their mental health. According to a number of studies, the percentage of medical staff with symptoms of post-traumatic distress was very high: 83.1% [34], 71.5% [31], 56.59% [33],

63.7% [26]. In contrast, the prevalence of distress among healthcare professionals in Chinese hospitals was significantly lower at 30% [29], 27% [31]. In our study, the indicators of post-traumatic distress were 36.92%, 42.40%, 43.31% on the IES-R subscales, which indicates a moderate level of distress in the studied medical workers of Ukraine.

According to a number of studies, the severity of mental disorders in health care professionals differed depending on the specific working conditions and the presence of direct contact with COVID-19 patients. Thus, the medical staff of intensive care and resuscitation departments had higher scores on the GAD-7, PHQ and PSS scales, which may be due to their close contact with patients [30]. Compared with non-clinical staff, health care workers in infectious diseases, intensive care units and emergency departments were 1.4 times more likely to experience fear, twice as likely to suffer from anxiety (HAMA) and depression (HAMD) [37]. However, some studies have shown other results. For example, the prevalence of anxiety was higher among non-clinical staff compared to health care workers (20.7% vs. 10.8%), and the anxiety and stress subscales on the DASS-21, the overall and subscales on the IES-R scale were also higher [16].

Our results are consistent with most studies showing that health care providers who pro-

vided direct care to COVID-19 patients had more severe symptoms of mental illness than those who did not.

That is why specialists working directly with COVID-19 pandemic need special attention and development and implementation of special programs of psychological and psychiatric care, preventive and rehabilitation measures aimed at improving their mental health state. The results of our survey of health workers confirm the urgent need to provide them with psychosocial support in the context of the COVID-19 pandemic, but, at the same time, indicates a very high level of unmet need. To ensure the continued and effective work of medical personnel during the COVID-19 pandemic, the protection of their mental health and social and psychological support must be one of the priorities of the health care system and the state as a whole.

**Limitations.** The cross-sectional nature of our study, which was conducted over a short period of time, does not allow us to assess the dynamics of the symptoms of mental disorders. The lack of data on the mental health of respondents before the pandemic does not allow us to fully determine the impact of the situation on the occurrence of mental disorders. In addition, the online survey format allows a certain bias of respondents.

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