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Burnout and its Factors in Healthcare Specialists Involved in Providing Care for Patients with Covid-19 at Different Stages of the Pandemic

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ABSTRACT In the context of the pandemic, when healthcare professionals are forced to work under extreme stress and an increased threat of infection, research on professional burnout and emotional maladjustment of medical workers is gaining particular relevance around the world.

AIM OF STUDY To assess the severity of symptoms of depression and anxiety, professional burnout and emotional distress among the employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, providing care to patients with COVID-19 in the current period (July). To compare them with the indicators of a mixed sample of medical specialists from different institutions and regions surveyed in the first months of the pandemic (March–April), and also to highlight the main factors of distress and protective factors.

MATERIAL AND METHODS The research methods were combined into a Google form, and participation in the research was anonymous. Of the 175 people who were sent questionnaires, 120 people (69% samples) filled out the form completely (69% samples), among them 43 men and 77 women, 54.2% were doctors of different specialties; 40% were nurses, the rest of the categories accounted for 5.8% of the sample. The mean age of the respondents was 36.1 years (from 21 to 61 years).

RESULTS The data obtained on the indicators of mental distress are generally consistent with international data: 8.3% of the surveyed people demonstrate symptoms of depression of moderate and great severity according to the Beck's Depression Scale; 6.7 % of the surveyed employees noted the presence of suicidal thoughts; 29.3% had symptoms of anxiety of moderate and high severity according to the Beck's Anxiety Scale. But 35% of the surveyed people had high level of emotional exhaustion according to the Maslach Burnout Inventory. Nevertheless, the data obtained indicate a greater mental well-being of employees of the N.V. Sklifosovsky Research Institute in comparison with a mixed sample of specialists surveyed in March – April. The limitations of such a comparison are indicated, they are associated with differences in organizational affiliation and the composition of specialists. Anxiety for family members (noted by 54.7%) and fear of infection (noted by 38.3%) were most often named as an important factor of distress in the entire sample of 120 people. The most significant protective factors (reducing the level of distress), noted by more than half of the employees, were information about the current situation and tasks from the management, support from family and colleagues, material incentives and the opportunity to take breaks for rest. Based on the data of the regression analysis, it is concluded that it is important to take measures for psychological relief, provide personnel with protective equipment, reduce the level of physical discomfort associated with the use of personal protective equipment and lack of sleep, explain to the staff the meaning of all measures and decisions taken, and collegial discussion of the organization of work. The quality of support from relatives, colleagues and administration helps maintain a sense of the importance of people profession and self-respect for themselves as a professionals among medical personnel.

Keywords: COVID-19 pandemic, healthcare workers, professional burnout, depressive symptoms, anxiety symptoms, emotional distress, emotional exhaustion, depersonification, professional efficacy, distress factors, protective factors

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INTRODUCTION

In the context of a pandemic of the new coronavirus infection, health systems of all countries are experiencing common difficulties. Infection causing severe acute respiratory syndrome officially named COVID-19 (CoronaVirus disease 2019), pathogen – SARS-CoV-2 (Severe Acute Respiratory Syndrome CoronaVirus-2). The increase in morbidity leads to the need for a global restructuring of medical institutions in order to provide care to patients with COVID-19, while medical personnel are forced to work under extreme stress and an increased threat of infection. For example, a recently published article in the journal Lancet [1] presents the results of a dynamic study of the infection rate of 200 medical specialists at the National Health Service Clinic in London involved in caring for patients with coronavirus infection. Eighty seven health workers (44%) out of 200 showed signs of infection with SARS-CoV-2, which is double the corresponding statistics for the population of London. Moreover, there was a trend towards higher infection rates among participants under 30 years old. Personal protective equipment (PPE) for all interactions with patients in England was introduced on 1 April 2020.

According to domestic and international data, a high level of workload and the threat of infection significantly increase the risk of professional burnout and emotional maladjustment in the form of symptoms of depression, anxiety and emotional distress among healthcare workers during a pandemic [2, 3]. At the same time, it is important to emphasize that the level of professional burnout among medical workers was the highest among specialists in helping professions even before the pandemic [4–7].

When comparing the severity of emotional maladjustment in medical workers before and after the onset of the epidemic, there is a significant increase in the values of depression and anxiety according to the corresponding scales. In a study of pediatricians working with severe syndromes, in 2019, 7.3 and 14.1% of subjects were noted with depression and anxiety values above the threshold [8] according to the HADS method (Hospital Anxiety and Depression Scale). The number of doctors and nurses with high scores on the depression and anxiety scales while working with coronavirus was 34% on the anxiety scale and 19% on the depression scale using the example of Jordan [9]; 32.3% – on the depression scale and 34.1% – on the anxiety scale among specialists from Oman [10]. In a cohort study of 3,537 healthcare professionals from the UK, Poland and Singapore, 20% of respondents had higher anxiety scores and 11% had higher depression scores [11]. Similar alarming results can be observed in the professional burnout questionnaire – for example, a high risk of burnout in the same study was found in 67% of specialists [11].

Studies of the severity of emotional maladjustment of medical workers over time using the example of previous epidemics have shown that even 3 years after the end of the SARS (Severe Acute Respiratory Syndrome) epidemic in Beijing, 14% of employees showed moderate values on the depression scale, and 8.8% employees – high values [12]. According to other data, 30.4% of medical workers who had contact with victims noted a high degree of professional burnout. [13]. Such results confirm the need for dynamic monitoring of the psychological well-being of medical personnel, despite a possible general decrease in the incidence of the population. It is necessary to accumulate experience and plan effective and scientifically based recommendations for the prevention of psychological distress of medical workers in the long term.

To create such recommendations in a number of countries, the problem of emotional maladjustment and professional burnout of medical workers is considered taking into account the factors of distress and the so-called protective factors that help to mitigate the negative impact of stress on psychological well-being. These data for the periods of different epidemics were summarized in a large-scale study [2]. Here are the latest data from a study of workers in one of the hospitals in Germany [14], according to which the most common risk factors are:

– 37,5% – work stress, which implies conflicts with colleagues, changes in the work atmosphere, team changes and increased workload;
– 30% – indeterminacy;
– 23,8% – the need to take care of someone, which includes not only communication with patients, but also with the family;
– 16,3% – psychosocial tension, implying the consequences of self-isolation and the disturbed balance between work and personal life;
– 12,5% – risk of infection.

Another major stressor is the physical discomfort associated with the need for PPE. In a study of Wuhan nurses who had close contact with patients, and therefore the most burdensome PPE, the influence of this factor on the growth of anxiety and subsequent psychological distress, up to a tendency to an important factor of depression – the so-called ruminating, or repetitive thoughts of negative content about possible mistakes and their negative impact on the present and future. Prolonged exhaustion against the background of such a “stuck” or negative “filter” can lead to suicidal thoughts. Indeed, this symptom was found in 6.5% of respondents [15]. In a large-scale study of 8817 workers, the presence of auto-aggressive behavior and suicidal tendencies was also found in 6.5% of them [16].

Multivariate regression analysis showed more pronounced symptoms of anxiety and wasting in women. In comparison by age, it was found that the group of 18–24 years old compared to the group of 55–64 years old had more pronounced anxiety, depression and physical fatigue. The group of 25–34 years old showed symptoms of depression and physical fatigue, and the group of 35–54 years old – physical fatigue. Binary logistic regression revealed a “portrait” of the most vulnerable group with the following characteristics: young age, female gender, lack of family support and low income. Similar patterns can be found in a number of other studies. So in a cross-sectional survey of 1257 representatives of 34 hospitals in China, young nurses were also the most vulnerable [17]. This set of characteristics was associated with an increased likelihood of physical fatigue and, as a consequence, the risk of manifestation of depression and anxiety [18]. The presence of severe physical fatigue is an important factor in stress and

emotional maladjustment. Including it was found that it increases not only the risk of depression and anxiety, but also death from cardiovascular diseases [18]. Numerous studies conducted before the pandemic have also shown that occupational burnout increases the risk of serious somatic diseases in physicians [6]. According to a number of data, nurses are considered to be a high-risk occupational group due to prolonged contact with the patient [2].

Recent data from a San Francisco health worker during the early phase of the pandemic, published July 21, 2020 in Academic Emergency Medicine, found small differences in emotional well-being between men and women, with women reporting higher levels of stress. Among male doctors, the stress level, both at work and at home, was 5 on a scale of 1 to 7, and for women it was 6 in both regions. Both men and women also reported that levels of emotional exhaustion or burnout increased during the pandemic [19].

In the same study, PPE shortages were found to be associated with the highest level of concern and were also the most frequently cited measure that would provide the greatest relief. Doctors also expressed concern about the unreliability of rapid diagnostic testing, the risk of spreading the disease among discharged patients, and the welfare of employees diagnosed with COVID-19. [19].

But the survey also showed clear ways to mitigate anxiety:

– improve access to PPE;

– increase the availability of rapid testing;

– communicate clearly about changes to the COVID- 19 treatment protocol;

– provide access to self-assessment and personal leave for professionals working on the front lines of the pandemic.

Another study also noted the role of strong negative emotions in increasing levels of distress in health care workers. The influence of anxiety, guilt and loneliness on a negative assessment of one's own health and professional success was revealed. All this contributed to demoralization and confidence in the inevitability of infection [20].

As the protective factors of psychological well-being, according to a study by German colleagues, were:

– 64,3% – home support;

– 45,3% – time and opportunity to relax outside the hospital;

– 22,6% – support at work, primarily from colleagues, patients and professional recognition;

– 13,1% – personality traits, such as optimism, humor, psychological flexibility, experience [14].

A study of the experience of the SARS epidemic (in many ways similar to COVID-19) has also shown the role of organizational support and the availability of qualified training for the psychological well-being of the health worker. [13].

Studies that take into account the long-term effects of stress after experience with an infectious disease, as well as assess the influence of stress factors and protective factors for mental well-being, are an important basis for the development of methods of effective psychological assistance [12]. In a study of the role of psychological assistance in maintaining the psychological well-being of doctors during a pandemic in China, about 38% of specialists positively assessed the benefits and significance of such work, which prompted the government of the People's Republic of China to increase the number of psychological support services. The authors emphasize that a similar trend can be traced within each epidemic [21]. The creation of materials for public education is also recognized as important. A study of 1257 respondents in the early stages of the epidemic (in March 2020) noted the presence of high rates on the scales of depression and anxiety – in 50.7% and 44.6% of them, respectively [17]. At the same time, with a later survey of 2,614 specialists (of whom 14.8% were medical workers) in June 2020 (after the creation and distribution of such materials), depression and anxiety indicators decreased to 34.6% and 13.3 % respectively. A number of authors suggest that similar results may be related to the creation of online help services and exercise booklets to prevent professional burnout and anxiety [18].

For several months after the start of the pandemic, medical workers continue to work under conditions of increased workload, which sharply raises the question of assessing their psychological state. In a dynamic study of the psychological well-being of doctors in China, an increase in the severity of anxiety symptoms was found (observed in 35% of those surveyed in the last cut compared to 24.5% in the earlier one) and a slightly decreased rates of depression symptoms (from 26.4% in the earlier surveyed to 24% in the last cut) [21]. Recently, data from a Russian study conducted in the early months of the pandemic was published, which included survey data and comparison of professional burnout and emotional maladjustment of medical workers from Moscow and other regions of Russia. It compared the indicators of emotional maladjustment of medical workers who took part in caring for patients with coronavirus infection and did not participate in this work. Indicators of anxiety and depression symptoms were significantly higher in participants in care of the infected [3]. It seems important to assess the dynamics of mental state indicators among Russian specialists involved in providing care to infected patients in different periods of the pandemic. To do this, it is important to compare research data for the first (March-April) and last (July) months since the beginning of the spread of coronavirus infection in Russia.

Purpose of the study. To assess the severity and main factors of symptoms of emotional maladjustment, professional burnout and emotional distress in employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, providing care to patients with COVID-19 in the current period (July), and compare them with the indicators of a mixed sample of medical specialists from different institutions and regions surveyed in the first months of the pandemic (March-April).

MATERIAL AND METHODS

ORGANIZATION OF WORK OF MEDICAL PERSONNEL WITH COVID-19 PATIENTS IN N.V. SKLIFOSOVSKY INSTITUTE

In March 2020, at the N.V. Sklifosovsky Research Institute for Emergency Medicine, two buildings were reorganized (cardiac and cardiac surgery buildings No. 6 and No. 6a) to treat patients with new coronavirus infection. Part of one of the buildings was set aside for the placement of intensive care beds. Patients were admitted via the ambulance channel, as well as in the case of a positive analysis by the polymerase chain reaction method at the time of hospitalization in other clinical departments of the institute. Subsequently, such patients were placed in a quarantine zone, which was located at the site of one of the intensive care units of the main building, where a decision was made on their further hospitalization.

At first (March-April), many patients who were in the converted building had mild asymptomatic forms of the disease, which caused them irritation due to the need to be in a closed space in a hospital (some resorted to manipulations and threats to doctors and administration). In the future, patients who need constant medical supervision began to be treated. In order to ensure the safety and prevention of professional burnout of medical

personnel, a number of organizational measures were taken. The building was divided into “red” and “green” zones. In the “green” zone (on the ground floor) there were rooms for changing uniforms and using PPE. According to the regulations, it was required to put on a clean cloth uniform and shoes, which were issued according to the size, and only then put on PPE. In case of difficulties in putting on PPE, you could turn to the medical personnel on duty in this area for help. On the top floor there were staff rooms, dining rooms and recreation areas. In the “red” zone, there were always doctors on duty, paramedics and other personnel (patronage and patient care service). In addition, consultants and other non-medical personnel (including clinical psychologists) visited the departments, who also worked in a full set of PPE. Protective masks were a particular obstacle during work, since their fogging led to a deterioration in visibility, which is especially important for doctors of hardware diagnostics, resuscitation specialists and surgeons.

Doctors treating patients in wards and nursing staff changed every 4 hours during the day. Resuscitation teams took short breaks from work during the day. It was forbidden to bring objects into the “red” zone, so the doctors communicated over the radios (telephones remained in the “green” zone). To return back to the “green” zone, it was necessary to go through 2 phases of changing clothes: to take off the protective suit – to go into the “green” zone – to take off the fabric uniform and shoes.

The employees were provided with water and adequate food. In the “green” zone there were both zones for the administrative part of work (filling in medical cards, calling doctors for planned consultations) and for rest. The eating zones were located directly in the staff rooms, which were allocated to each department. For relaxation, special areas were equipped on the floor, however, no separate rooms were allocated, which caused some inconvenience.

The psychological service of the Institute took an active part in the work with patients. It is known that during a pandemic, psychologists are among the most demanded specialists. The work of psychologists was aimed at normalizing the psychological state of patients, which was also an important element in helping doctors and nurses. In the early stages of the pandemic, insufficient awareness of patients about the disease, unexpected hospitalization, the asymptomatic nature of the course in some cases and a low level of compliance led to impaired adaptation and increased anxiety, which was manifested by a hostile attitude towards medical personnel and refusal of diagnostic or treatment procedures. Safety requirements at work caused difficulties in face-to-face psychological counseling, since a protective suit destroyed empathic contact, glasses and a mask made it difficult to notice the patient’s delicate facial movements, a respirator changed his voice, and a multi-room ward violated confidentiality conditions. To partially solve these problems, the psychologist’s photo was glued to his protective suit. The psychological service of the Institute, together with the staff of the Moscow State Psychological and Pedagogical University, developed a memo for patients, which described the stages of emotional response to a problem and recommendations for coping with negative experiences, a memo offered relaxation techniques and psychological service contacts for consultations via video communication (wards were equipped with computers and high-speed internet access). Also, materials were prepared for medical personnel aimed at relieving psychological stress and preventing professional burnout using simple psychotechnical exercises with proven effectiveness.

RESEARCH METHODS

Organization of research. Medical workers involved in the care of patients with coronavirus infection in buildings 6 and 6a were asked to fill in a number of questionnaires. The techniques were combined into a google form, a link to which was posted in a specially created chat. All survey participants were given the opportunity to receive feedback with short recommendations; participation in the study was anonymous and confidential. The study was conducted over 5 days from 7 to 11 July 2020. After that, the form was closed. The methodological package was exactly the same as in an earlier study of a mixed sample of specialists from different institutions and regions involved in treating patients with COVID-19. [3]. However, during the course of this study, some respondents noted additional distressing and protective factors that were not envisioned in the original form. In particular, among the protective factors, the importance of support from colleagues and administration was noted. Therefore, the form was supplemented in the course of the study, and only a part of the respondents of the surveyed sample answered a number of questions.

Surveyed sample. Of the 175 people to whom the questionnaires were sent, 120 people (43 men and 77 women) filled out the form completely, which constituted 69% of the sample. The psychological service received a request for feedback from 46 employees. The average age of the respondents was 36.1 years (from 21 to 61 years).

More than two thirds of the sample consisted of respondents under 40 – 76 years old (63.3%). Fig. 1 shows the distribution of the sample by age. As seen from Fig. 1, more than half of the sample consisted of doctors of various specialties (65 respondents – 54.2%); 48 (40%) – were nurses. The rest of the categories of specialists in aggregate constituted 5.8% of the sample, of which 5 persons (4.2%) were medical psychologists and 2 men (1.6%) were non-medical personnel.

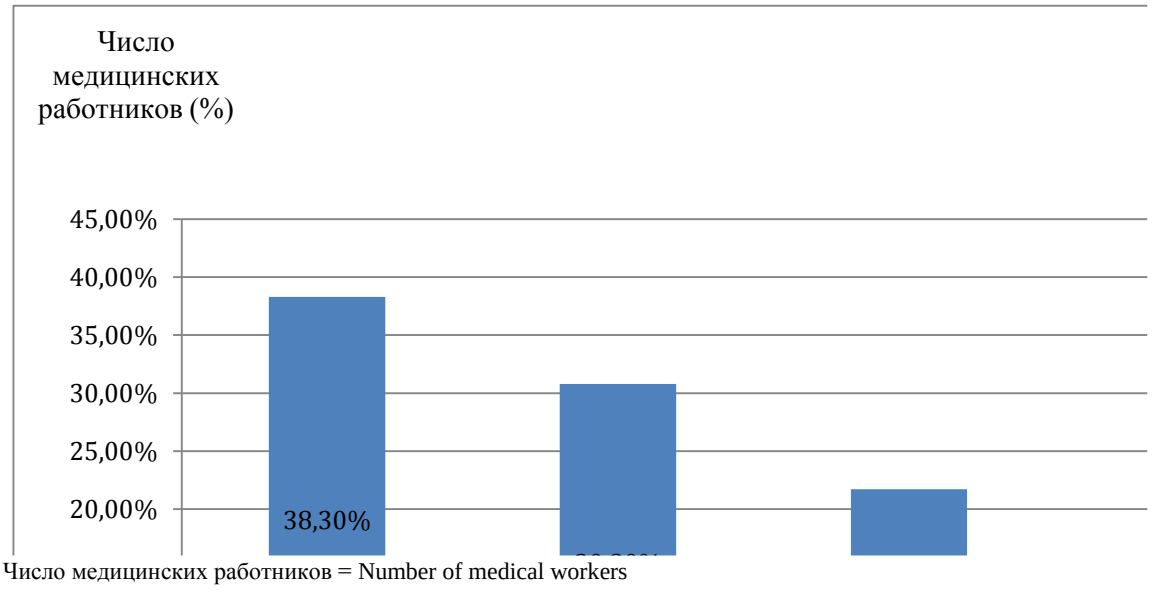


Fig. 1. Distribution of health specialists by age in the sample of N.V. Sklifosovsky Institute

To compare the indicators in the first months of the pandemic and in the current period, data from a survey of a mixed sample of specialists involved in providing care to patients with coronavirus infection in Moscow and other regions of Russia in March-April were used. The sample included 96 persons. The study was carried out starting on March 15, 2020, when the scale of the epidemic was already significant and a self-isolation regime was soon introduced for most of the population. Data collection was completed on May 2, 2020.

The limitations of such a comparison are related to the fact that in the main surveyed sample, all respondents worked in one institution – the N.V. Sklifosovsky Research Institute. At the same time, a mixed sample of 96 people included 30 employees (31.3%) from the N.V. Sklifosovsky Institute, 32 – from other medical institutions in Moscow (33.3%) and 34 – (35.4%) from medical institutions of Tyumen and Surgut. In addition, a sample from the N.V. Sklifosovsky Institute, mainly doctors – 65 people (54.2%) and nursing staff – 48 people (40%), while the mixed sample included 57 doctors (59.4%), 28 residents (29.2%), 9 (9.4%) nurses and 2 students (2.1%).

Research methods. The study used the following techniques:

1. A questionnaire aimed at collecting socio-demographic data (gender, age, place of residence) and information about the type of institution, specialty, position and participation in providing care to patients with COVID-19.

2. The questionnaire of professional burnout by K. Maslach [5, 22], which includes three scales: “emotional exhaustion” (feeling very tired, affective lability, loss of interest and positive feelings towards others, feeling “satiated” with work, dissatisfaction with life in general); "depersonalization" (emotional detachment and indifference, formal performance of professional duties without personal involvement and empathy, and in some cases – negativism and professional cynicism) and "professional success" (the degree of satisfaction of a medical worker with oneself as a person and as a professional). The first two scales are direct, that is, the higher the indicators, the higher the burnout, but the third scale is the opposite, that is, the higher the indicators, the less burnout (see the description of the method for more details) [3].

3. A. Beck's Depression and Anxiety Scales, validated on a Russian sample by N.V. Tarabrina [23].

4. The Distress Rating Scale (Distress Thermometer) is a screening tool designed to assess emotional discomfort in patients with life-threatening medical conditions and to identify the main areas that contribute to emotional distress [24]. The scale has been adapted and translated into Russian [25]. Clinical psychologists who co-authored this article identified the main areas of distress among healthcare workers during a pandemic: "concern/anxiety", "nervousness", "depression", "resistance/unwillingness to change", "passivity", "loneliness/feeling isolation”,“fear of getting infected/infecting”,“anger/irritability”,“boredom/ apathy”,“disagreement with the leadership/mistrust of the leadership”,“physical discomfort”(wearing a uniform, lack of sleep),“organizational difficulties”(distribution of responsibilities, lack of operational communication between specialists), “the need to quickly master unusual work”, “information noise” (a large amount of different information, constant changes in information), “aggressive behavior of patients”, “lack of medical protection”. Participants were asked to rate each factor on a scale: from "did not bother at all" (0 points) to "strongly worried" (3 points). In addition, in the "Other" column it was suggested to name some other areas of distress that were not included in the list initially. Fear of contamination of relatives was mentioned by several respondents at the very beginning of data collection and was added to the general list during the study. As in the original version of the methodology, areas of distress were combined into domains: emotional, physical, organizational and communication problems. Communicative, in turn, were divided into difficulties in communicating with management and difficulties in communicating with patients.

Also, in the course of the study, a list of protective factors was highlighted and included in the Google form, which were mentioned in the chat by the respondents (for example, several people wrote about the importance of support from colleagues and management). As a result, the following protectors were identified: "information about the current situation and tasks from the management", "support from colleagues", "support from the administration", "material encouragement", "gratitude of patients", "gratitude and support from society","family support","access to psychological

information on ways to relieve stress","the ability to take breaks for rest". They, in turn, have been combined into the following domains: interpersonal support, material support, social value (public acceptance) and organizational support.

Analyzing the concept of emotional distress, the authors of the validation of the “Scale for assessing distress” on a Russian sample for patients aged 7–18 years emphasize that its level is not a clinical diagnosis and is not used in diagnostic and statistical manuals for mental disorders. However, according to the results of the conducted studies, the detected level of emotional distress is a clinically significant indicator that may indicate the presence of depressive and anxiety disorders, as well as adjustment disordersHowever, according to the results of the conducted studies, the detected level of emotional distress is a clinically significant indicator that may indicate the presence of depressive and anxiety disorders, as well as adjustment disorders. However, according to the results of the conducted studies, the detected level of emotional distress is a clinically significant indicator that may indicate the presence of depressive and anxiety disorders, as well as adjustment disorders [26].

RESULTS OF THE STUDY

INDICATORS OF PSYCHOLOGICAL UNWEELING IN THE SAMPLE OF MEDICAL WORKERS – PARTICIPANTS IN CARE FOR PATIENTS WITH COVID-19 FROM THE N.V. SKLIFOSOVSKY INSTITUTE (DATA FOR JULY) AND A MIXED SAMPLE OF SPECIALISTS FROM DIFFERENT MEDICAL INSTITUTIONS AND REGIONS OF RUSSIA (DATA FOR MARCH–APRIL)

The influence of gender, age and affiliation with medical and nursing staff were studied. In the surveyed sample of 120 employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, the gender factor affects the indicators of mental distress, which were higher in women at a high level of statistical significance: symptoms of depression ($p < 0.001$) and anxiety ($p < 0.001$), as well as the general indicator of distress ($p < 0.01$). This is in line with data published on July 21, 2020 in Academic Emergency Medicine on more pronounced rates of mental health problems in women working with infected patients. [19]. The results of univariate analysis of variance also showed that medical workers of a younger age group (under 28 years old) experience more pronounced symptoms of depression and anxiety ($p < 0.001$) and emotional exhaustion ($p < 0.001$) than medical workers over 41 years old (statistically significant in both cases). These results are consistent with data from other studies [18], and work experience is indicated as one of the explanatory factors of psychological resistance to stress [2]. There were no statistically significant differences in indicators of emotional maladjustment, professional burnout, and distress between doctors and nurses, so comparison data are not presented here.

Below is the distribution of respondents depending on the severity of symptoms of depression and anxiety (Tables 1 and 2) in comparison with similar data obtained in a mixed sample of specialists from different institutions and regions interviewed in March – April 2020.

Table 1

The number of employees providing health care for patients with COVID-19 of varying degrees of severity of the symptoms of depression and suicidal ideation (Beck’s Depression Inventory) in a sample of N.V. Sklifosovsky Institute (n=120, July) and a mixed sample surveyed in the first months of the pandemic (n=96, March–April)

Beck’s Depression Inventory	Sample “Sklif” (July) n (%)	Mixed sample (March-April) n (%)
No symptoms (0–13)	101 (84.1%)	54 (56.2%)
Mild symptoms (14–18)	9 (7.5%)	14 (14.6%)
Moderate symptoms (19–28)	9 (7.5%)	14 (14.6%)
Significant symptoms (29 and more)	1 (0.8%)	14 (14.6%)
Suicidal thoughts	8 (6.7%)	10 (10.4%)
Suicidal intents	0 (0%)	2 (2.1%)

Table 2

The number of employees providing health care for patients with COVID -19 of varying degrees anxiety symptoms severity (Beck's Anxiety Scale) in a sample of N.V. Sklifosovsky Institute (n=120, July) and a mixed sample surveyed in the first months of the pandemic (n=96, March–April)

Beck's Anxiety Scale	Sample "Sklif" (July) n (%)	Mixed sample (March - April) n (%)
No symptoms of anxiety (0-4)	45 (37.5%)	32 (33.3%)
Mild anxiety symptoms (5-13)	36 (30%)	33 (34.4%)
Moderate anxiety symptoms (14-18)	16 (13.3%)	10 (10.4%)
High intensity anxiety symptoms (19 or more)	22 (18.3%)	21 (21.9%)

As you can see from the Table 1, symptoms of depression of varying severity were noted in 19 people – 15.8% of the surveyed sample, and moderate and severe symptoms were noted only in 10 people (8.3%). At the same time, the presence of suicidal thoughts was noted in 8 people (6.7%), and none of the respondents expressed suicidal intentions. These data are more favorable than the above values on the hospital anxiety and depression scale (HADS) in an international study [11], as well as in comparison with the data of a mixed Russian sample, which included medical personnel from different institutions in Moscow and other regions of Russia, examined in the first months of the pandemic. [3]. In the mixed sample, indicators of moderate and severe depression were noted in 29.2% of the sample, which is more than three times higher than the indicators of the current study, but is consistent with the mentioned international data [11, 21]. The suicidal tendencies also decreased by almost half: from 12.5% in the first months of the pandemic to 6.7% at this moment (July 2020). At the same time, attention is drawn to the coincidence of the data of the actual sample from the N.V. Sklifosovsky Institute with the data of Chinese colleagues who revealed similar suicidal indicators in two large-scale samples of medical personnel – 6.5% of respondents [15, 16].

As you can see from the Table. 2 symptoms of anxiety of varying severity are noted in 74 employees of the N.V. Sklifosovsky Institute (62.5% of the surveyed), and symptoms of medium and high degrees of intensity are observed in 38 people, which is almost a third of the sample (31.6%).

These data do not actually differ from the data of a mixed Russian sample, which included medical personnel from different institutions in Moscow and other regions of Russia and surveyed in the first months of the pandemic [3]. In the mixed sample, 64 people (66.7%) noted anxiety of varying severity, and indicators of anxiety of medium and high degrees of intensity were noted in 31.2% of the sample. Thus, a third of medical workers retain high values of anxiety indicators, which correlates with the data of foreign studies considered above [9–11].

The distribution of the surveyed respondents by intervals (low, medium and high values of indicators of professional burnout of the questionnaire K. Maslach) is presented in Table. 3.

Table 3

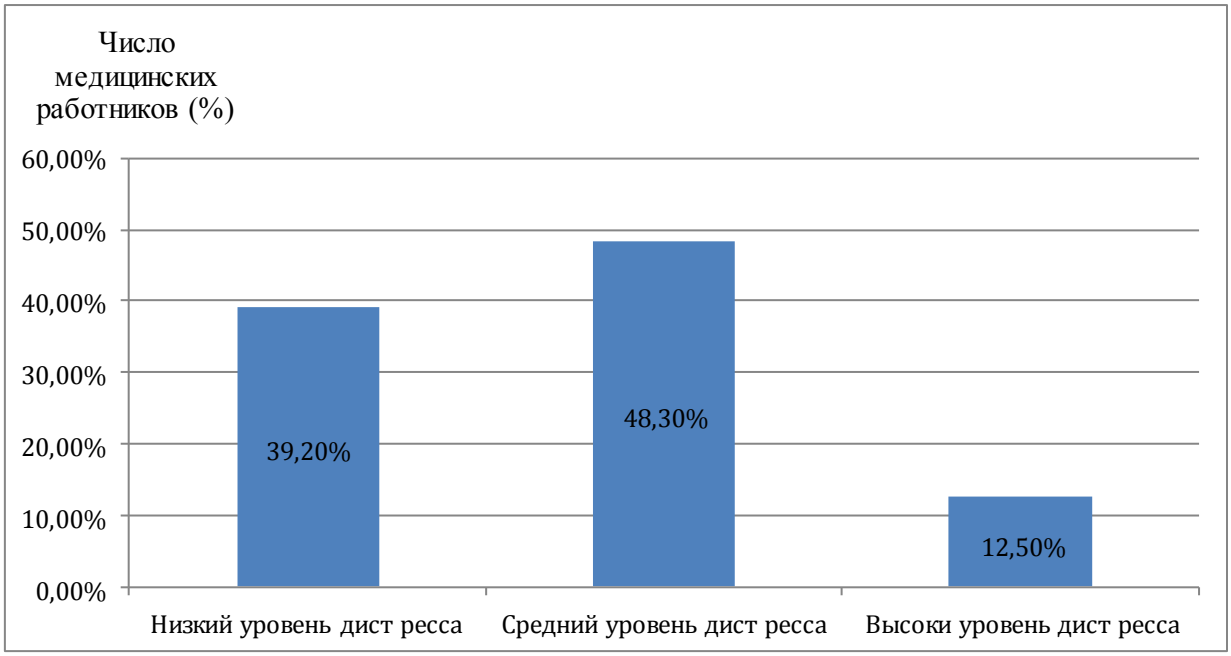
The number of employees providing care for patients with COVID-19 with low, moderate and high levels of burnout (Maslach Burnout Inventory) in a sample of N.V. Sklifosovsky Research Institute for Emergency Medicine (n=120, July)

Various parameters of professional burnout	Low level burnout n (%)	Middle level burnout n (%)	High level burnout n (%)
Emotional exhaustion (high burnout)	53 (44.2%)	25 (20.8%)	42 (35%)
Depersonification (high burnout)	9 (7.5%)	43 (35.8%)	68 (56.7%)
Professional success (reduction of personal achievements - high burnout)	59 (49.2%)	36 (30%)	25 (20.8%)

From Table 3 it follows that the ratio of employees who noted a low degree of emotional exhaustion (44.2%) and a high degree of professional success (49.2%) is close to and approximately equal to half of the respondents. A high degree of emotional exhaustion is noted in a third of employees (35%), and a feeling of their professional failure in 20.8% of them. It is noteworthy that only 7.5% of respondents have a low level of

burnout on the depersonalization scale, and 56.7% of employees show a high level of burnout on this scale. That is, of all three scales, the highest burnout level is most often noted on this scale. Depersonification is expressed in a high degree of detachment from employees personalized communication with patients and the extreme formalization of contact, up to professional cynicism, and possibly acts not only as a symptom of burnout, but also as a way to protect medical workers from the loss of resources under extreme stress in a pandemic.

Fig. 2 shows the results according to the "Distress Thermometer" method. All respondents, depending on their assessment of their level of distress, were divided into three groups: 0–3 points – low level; 4–7 points – average level; 8-10 points – high level.

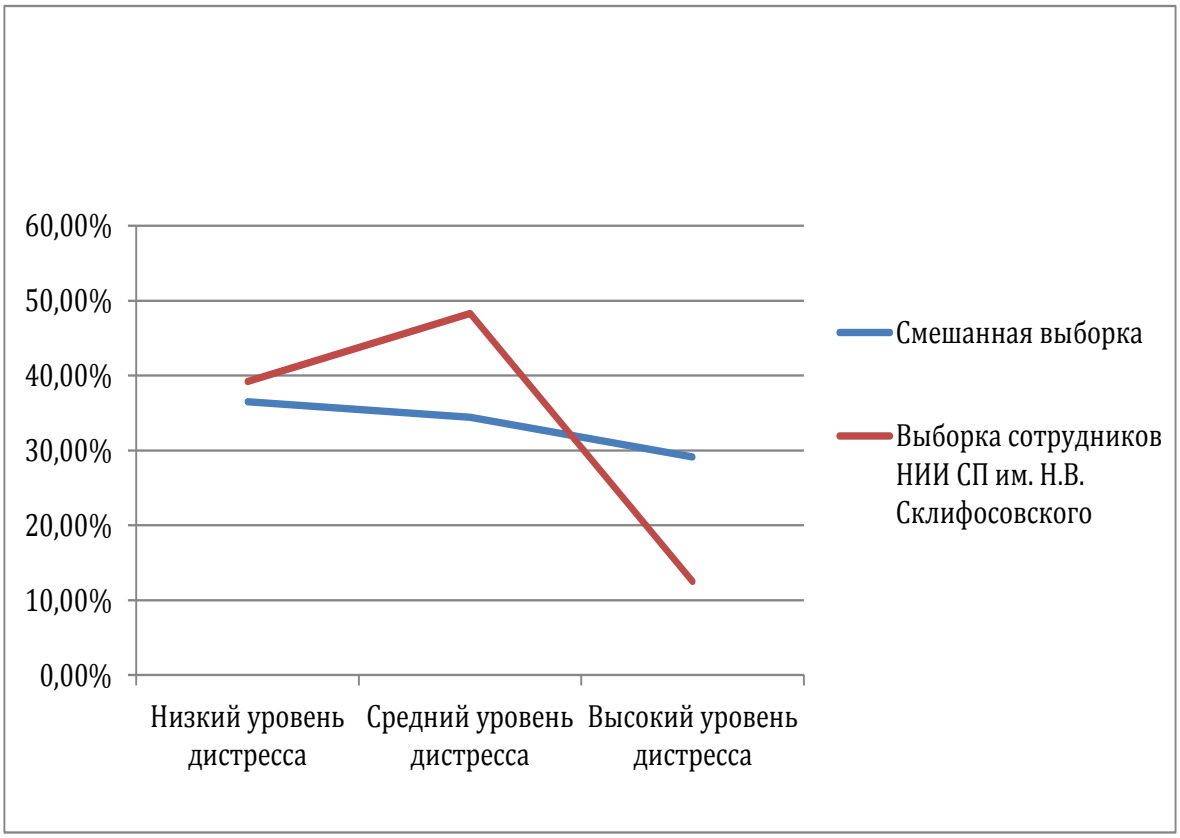


Число медицинских работников = Number of medical workers

Fig. 2. The sampling distribution of health workers by level of distress in a sample of N.V. Sklifosovsky Institute employees

As seen in Fig. 2, more than a third of the respondents rated their level of distress as low (that is, no more than 3 points out of 10), half of employees (48.3%) chose a score from 4 to 7 points, and only 12.5% noted extremely high levels of distress – from 8 to 10 points. Analysis of this sample, including 15 people, made it possible to create a "portrait" of a specialist experiencing the highest level of distress. Almost all respondents have high rates of emotional exhaustion (93%), two-thirds record a high level of depersonalization and anxiety (73% and 67%, respectively) and only 13% consider themselves professionally successful. The main factors of distress in the considered sample are fear of infection (80%) and concern for family members (93%). Almost all noted material incentives and the allocation of time for rest (93%) as important factors in stress mitigation (93%), the overwhelming majority also consider it important for themselves to receive information from the management, gratitude and recognition from society and support from the family (83%), more than two thirds respondents feel a strong need for peer and management support (75%). Most of them are women (nurses and doctors) under 40. In general, this fact is consistent with the data mentioned above the highest exposure to stress in women.

We also compared the indicators of the severity of distress in a sample of employees of the N.V. Sklifosovsky Institute (n = 120, July) and a mixed sample (n = 96, March – April) (Fig. 3).



Смешанная выборка = Mixed sample
Выборка сотрудников НИИ СП им. Н.В. Склифосовского = Sample of N.V. Sklifosovsky Institute
Низкий уровень дистресса = Low level of distress
Средний уровень дистресса = Average level of distress
Высокий уровень дистресса = High level of distress

Fig. 3. The number of respondents having low, moderate and high values of distress obtained in a mixed sample surveyed in the first months of the pandemic (n=96, March–April), and quartile intervals of the sample of employees of N.V. Sklifosovsky Institute (n=120, July)

As seen in Fig. 3, approximately the same number of respondents designated the level of experienced distress as low in both samples (39.2% in the sample of employees of the N.V. Sklifosovsky Institute and 36.5% in the mixed sample). At the same time, in a mixed sample, respondents more than 2 times more often note a high level of distress (29.1% versus 12.5% in the "Sklif" sample).

Let us now consider which areas of distress are the most significant, that is, are noted by a larger number of study participants as sources of increased anxiety.

In a study conducted in July 2020 on a sample of employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, 3 more distress factors were added (difficulties in communicating with patients and their relatives and concern for the safety of the family), which were not in the mixed sample (therefore, these lines were omitted in the corresponding column). As you can see from the Table. 4, about a third or more of the respondents surveyed in July gave a rather high assessment of the impact of the following areas of distress: nervousness, fear of being infected or infecting others, physical discomfort, organizational difficulties, information noise and anxiety for family members. The most significant in terms of the degree of negative influence were noted concern for family members (54.7% of the sample) and fear of infection (38.3% of the sample). The mixed sample (March–April 2020) also noted the high significance of such distress factors as fear of infection (44%), organizational difficulties (47%) and information noise (56%). The main differences between the samples were obtained for the following factors: almost 2 times fewer employees at the N.V. Sklifosovsky Institute, in comparison with the mixed sample, experience stress due to unwillingness to go to work (20.8% versus 39% in the mixed sample), exactly 3 times less stress due to mistrust in management (15% versus 45% in the mixed sample) and, finally, they have more than 10 times less stress due to lack of PPE (4.2% versus 48% in a mixed sample).

Table 4

The number of employees providing health care with a high level of anxiety in various areas of emotional distress (distress thermometer method) in the sample of N.V. Sklifosovsky Research Institute for Emergency Medicine (n=120, July) and in a mixed sample (n=95, March–April)

Areas of emotional distress	Sample "Sklif" (July) n (%)	Mixed sample (March - April) n (%)
Agitation / Anxiety	29 (24.2%)	37 (39%)
Nervousness	33 (27.5%)	36 (38%)
Sadness / depression	28 (23.3%)	26 (27%)
Resistance / unwillingness to go to work	25 (20.8%)	38 (39%)
Passivity	17 (14.2%)	22 (23%)
Loneliness / feeling of isolation	24 (20%)	21 (22%)
Fear of being infected / infecting	46 (38.3%)	42 (44%)
Anger / irritability	27 (22.5%)	36 (38%)
Boredom / apathy	18 (15%)	25 (26%)
Disagreement with management / mistrust	18 (15%)	43 (45%)
Physical discomfort	37 (30.8%)	35 (37%)
Organizational difficulties	36 (30%)	45 (47%)
The need to quickly master unusual work	17 (14.2%)	24 (24%)
Information noise	35 (29.2%)	54 (56%)
Difficulty in communicating with patients	11 (9.2%)	-
Patient aggression	17 (14.2%)	23 (24%)
Difficulty in communicating with relatives	3 (2.5%)	-
Lack of medical protection	5 (4.2%)	46 (48%)
Family member safety concerns (added as the research progresses)	52 (54.7%) of 95	

Also, after comments in the chat about the importance of good organization of work and support from management and colleagues, protective factors were added to the Google form. The respondents were asked to rate the factors that help to cope with stress in the workplace. Nine protective factors were identified, the significance of which for reducing the level of distress was assessed by 95 out of 120 people (Table 5).

Table 5

The number of medical workers who rated the importance of certain protective factors as "2" and "3" points in the N.V. Sklifosovsky Institute sample (n=95, July)

Protective factors	Sample "Sklif" (July) n (%)
Information about the current situation and tasks from the side of the management	53 (54.6%)
Colleagues support	71 (59.2%)
Administration support	56 (46.7%)
Material incentives	70 (58.3%)
Patient gratitude	59 (49.2%)
Thanks and support from the community	59 (49.2%)
Family support	80 (66.7%)
Access to psychological information on ways to relieve stress	23 (19.2%)
Ability to take rest breaks	75 (62.5%)

As we can see from the Table 5, almost all factors were rated as subjectively important by almost half or more of those surveyed. However, only one fifth of employees (19.2%) noted the importance of access to psychological information about ways to relieve stress (recall that employees were offered of materials containing information about ways and the opportunity to get a free consultation with a psychologist). Perhaps this fact is due to the idea of doctors that they should cope on their own, without the help of a specialist and the lack of time to complete tasks on psychohygiene. Difficulties in seeking medical attention have been noted in a number of studies (see review) [6]. The most significant protective factors, noted by more than half of the employees, were the following: information from the management about the current situation and tasks (54.6%), support from the family (66.7%), support from colleagues (59.2%), material incentives (58.3%) and the opportunity to take breaks for rest (62.5%).

Now let us compare the percentage of employees who demonstrated a high level of burnout in both compared samples (Sklif, July and Mixed sample, March – April) according to the interval values obtained before the pandemic on a sample of specialists in social professions, including doctors [22] (Table. 6).

Table 6

The number of employees providing health care for patients with COVID-19 with high burnout rates (Maslach Burnout Inventory) in the sample of employees of N.V. Sklifosovsky Institute (n=120, July) and in a mixed sample (n=96, March–April)

Various parameters of professional burnout	Sample "Sklif " (July) n (%)	Mixed sample (March - April) n (%)
Emotional exhaustion (high burnout)	42 (35%)	64 (67%)
Depersonification (high burnout)	68 (56.7%)	94 (99%)
Professional success (reduction of personal achievements – high burnout)	25 (20.8%)	11 (11%)

As you can see from the Table. 6, in the mixed sample, high rates of emotional exhaustion and depersonification are almost 2 times more likely, and the feeling of professional success (inverse scale), on the contrary, is 2 times less common than in the sample of employees of the N.V. Sklifosovsky Institute. Thus, in terms of professional burnout, a sample of employees from the. N.V. Sklifosovsky Institute, surveyed in July, turned out to be more successful in comparison with the mixed sample of medical specialists from different institutions and regions of Russia, surveyed in March – April.

RESEARCH OF THE RELATIONSHIP OF INDICATORS OF EMOTIONAL DEADAPTATION, PROFESSIONAL BURNOUT, DISTRESS AND ITS FACTORS IN A SELECTION OF MEDICAL WORKERS – PARTICIPANTS OF CARE TO PATIENTS WITH COVID 19 IN N.V. SKLIFOSOVSKY INSTITUTE

Below are the results of a study of the relationship between indicators of emotional maladjustment (symptoms of depression and anxiety) and professional burnout in a sample of employees surveyed in July – participants in helping patients with COVID-19 from the N.V. Sklifosovsky Institute (Tab. 7).

Table 7

Correlations between depressive and anxiety symptoms (Depression Inventory and the Beck's anxiety scale) and indices of professional burnout (Maslach Burnout Inventory) in a sample of health professionals providing care for patients with COVID-19 at the N.V. Sklifosovsky Institute (n=120, July)

Questionnaire scales	Symptoms of depression	Symptoms of anxiety	Emotional exhaustion	Depersonification	Professional success
Depression symptoms		0.712 **	0.699 **	0.293 **	-0.304 **
Cognitive symptoms of depression	0.906 **	0.582 **	0.574 **	0.245 **	-0.317 **
Somatic symptoms of depression	0.933 **	0.727 **	0.699 **	0.304 **	-0.254 **
Symptoms of anxiety	0.712 **		0.654 **	0.218 *	-0.210 *
Emotional exhaustion (high burnout)	0.699 **	0.654 **		0.408 **	-0.397 **
Depersonification (high burnout)	0.293 **	0.218 *	0.408 **		-0.003
Professional success (reduction of personal achievements)	-0.304 **	-0.210 *	-0.397 **	-0.003	

*Note : * p < 0.05; ** p <0.01*

As you can see from the Table. 7 statistically significant correlations were obtained between symptoms of depression, in particular, cognitive and somatic symptoms, and indicators of professional burnout. It should be noted that the strongest positive relationship is found between symptoms of depression and emotional exhaustion. Weak statistically significant correlations are noted between symptoms of depression, depersonification and professional success, the latter correlation being negative. Similar relationships are also noted between anxiety symptoms and indicators of professional burnout: the higher the anxiety symptoms, the stronger emotional exhaustion, depersonification and reduction of professional success.

It was also important to understand which distress factors that arise during work with patients with coronavirus infection are most closely associated with symptoms of emotional maladjustment. To study the relationships, all the factors of distress were combined into domains – problem areas with a common focus (emotional, physical, organizational and communication problems). Table 8 shows the correlations between the symptoms of anxiety and depression and indicators for the selected domains.

Statistically significant correlations of all domains of problem areas of distress with indicators of depression, anxiety and a general indicator of distress were revealed. As you can see from the table. 8, the strongest statistically significant correlations are observed between emotional problems and the severity of symptoms of anxiety and depression. There are also strong correlations between physical problems associated with physical discomfort (PPE use and lack of sleep) and the severity of anxiety symptoms. This may also be due to the fact that anxiety symptoms have vivid

physiological manifestations and may be similar to discomfort when working in PPE. Statistically significant correlations of moderate strength are observed between organizational and communication problems and indicators of symptoms of anxiety and depression.

The results presented in table. 8 lead to the conclusion that symptoms of emotional maladjustment and the general indicator of distress are more strongly associated with emotional, physical and organizational problems and to a lesser extent with difficulties in communication. Strongest associations between problem areas of distress and symptoms of anxiety.

Table 8

Correlations between depressive and anxiety symptoms (Depression Inventory and the Beck's anxiety scale) and the median of the different domains of distress (distress thermometer method) in a sample of health professionals providing care for patients with COVID-19 at N.V. Sklifosovsky Institute (n=120, July)

Domains	Depression	Anxiety	Distress (general indicator)
Emotional problems	0.681 **	0.737 *	0.601 **
Physical problems	0.368 **	0.634 **	0.486 **
Organizational problems	0.489 **	0.517 **	0.408 **
Communication problems (patients)	0.413 **	0.442 **	0.422 **
Communication problems (senior managers)	0.268 **	0.355 **	0.206 *

*Note : * $p < 0.05$; ** $p < 0.01$*

Below are the results of the relationship of problem areas of distress with indicators of professional burnout (Table 9).

Table 9

Correlations between indices of professional burnout (Maslach Burnout Inventory) and averages of different domains of distress (Distress Thermometer Method) in a sample of health professionals providing care for patients with COVID-19 at N.V. Sklifosovsky Institute (n=120, July)

Domains	Emotional exhaustion	Depersonification	Professional success (reduction of personal achievements)
Emotional problems	0.716 **	0.248 **	-0.217 *
Physical problems	0.526 **	0.100	-0.130
Organizational problems	0.503 **	0.221 *	-0.207 *
Communication problems (patients)	0.348 **	0.084	-0.181 *
Communication problems (senior managers)	0.284 **	0.063	-0.079

Note : * $p < 0.05$; ** $p < 0.01$

As you can see from the Table. 9 strong statistically significant associations were found between negative emotional experiences, physical problems (associated with PPE use and lack of sleep), organizational problems and the level of emotional exhaustion. Weak but statistically significant associations were also obtained between negative emotional experiences, organizational problems and the level of depersonalization. Weak feedbacks were obtained between emotional, organizational and communicative (in dealing with patients) problems and a sense of professional success. Thus, the most closely identified areas of distress are associated with emotional exhaustion.

The study did not show the presence of statistically significant associations between the severity of symptoms of anxiety and depression and groups of protective factors; therefore, these data are not presented here. Further, the relationship of protective factors with symptoms of emotional maladjustment and symptoms of emotional burnout was investigated (Table 10).

As you can see from the Table. 10 protective factors are not associated with the level of emotional exhaustion, but interpersonal support has weak statistically significant feedbacks with the level of depersonalization, that is, good relationships with people to some extent protect specialists from professional cynicism. We also found weak statistically significant direct links between interpersonal and organizational support and a sense of

professional success. This means that the quality of support from relatives and colleagues, as well as good organization of work and support from the administration, contribute to maintaining a sense of the importance of the profession and self-respect for oneself as a professional.

Table 10

Correlations between depressive and anxiety symptoms (Depression Inventory and Beck's Anxiety Scale) and averages of different domains protective factors in a sample of health professionals providing care for patients with COVID -19 at N.V. Sklifosovsky Institute (n=95, July)

Domains	Emotional exhaustion	Depersonification	Professional success (reduction of personal achievements)
Interpersonal support	-0.121	-0.239 *	0.206 *
Material support	0.116	0.168	-0.054
Public importance (public recognition)	-0.078	-0.152	0.165
Organizational support	-0.022	-0.131	0.281 **

*Note : * p < 0.05; ** p <0.01*

THE INFLUENCE OF DISTRESS FACTORS AND PROTECTIVE FACTORS ON THE SYMPTOMS OF EMOTIONAL DEADAPTATION AND PROFESSIONAL BURNOUT IN A SELECTION OF MEDICAL WORKERS – PARTICIPANTS IN CARE OF PATIENTS WITH COVID-19 AT N.V. SKLIFOSOVSKY INSTITUTE

To assess the combined effect of factors on emotional maladjustment and professional burnout of medical workers, regression analysis was applied. Below are the results of regression analysis aimed at assessing the influence of distress factors and protective factors on the severity of emotional maladjustment and professional burnout (Table 11).

Table 11

The influence factors of distress (distress thermometer method) on the severity of depressive symptoms (Beck's Depression Inventory) in a sample of health professionals providing care for patients with COVID-19 at N.V. Sklifosovsky Institute (n=120, July)

Factors	The severity of symptoms of depression		
	Beta (β)	t	The level of statistical significance p
Nervousness	0.354	3.845	0.000
Difficulty communicating with patients	0.237	3.048	0.003
Sadness	0.263	2.811	0.006
Disagreement with management / mistrust	0.178	2.373	0.020

Basic notation:
Beta (β) – standard regression coefficient
t – Student's t test
p – level of statistical significance
R – multiple correlation coefficient
R2 – multiple determination coefficient
F – Fisher's test.

Several series of regression analyzes showed that the most statistically significant factors were nervousness (contributing the most), difficulty communicating with patients, and sadness. We also see that disagreement with management has an impact on the level of depression, but is the least statistically significant factor. The model explains 55% of the variance of the dependent variable "depression" (R2=0,546; F=27,011; p<0,001). This influence is understandable, since negative emotions are an important component of the depressive state, that is, the dependent and independent variables overlap.

A similar procedure was carried out to study the factors of distress that affect the level of anxiety (Table 12).

Table 12

The influence factors of distress (distress thermometer method) on severity of symptoms of anxiety (Beck's anxiety scale) in a sample of health professionals providing care for patients with COVID-19 at N.V. Sklifosovsky Institute (n=120, July)

Factors	The severity of anxiety symptoms		
	Beta (β)	t	The level of statistical significance p
Boredom / apathy	0.345	5.090	0.000
General level of distress	0.174	2.703	0.008
Lack of personal protective equipment	0.249	4.471	0.000
Physical discomfort	0.188	2.815	0.006
Disagreement with management / mistrust	0.165	3,000	0.004
Anger / irritability	0.212	3.383	0.001

As you can see from the Table. 12, statistically significant factors of distress for anxiety are somewhat different than symptoms of depression (Table 11). The most statistically significant are boredom, general level of distress, lack of PPE and physical discomfort. The least statistically significant factors affecting the severity of anxiety symptoms are disagreement with management (the only factor affecting the severity of depression symptoms) and irritability. The model explains 75% of the variance of the dependent variable "anxiety" ($R2=0,749$; $F=43,802$; $p<0,001$).

Table 13 shows the results of regression analysis aimed at studying the influence of distress factors on indicators of professional burnout.

Table 13

The influence factors of distress (distress thermometer method) on the severity of symptoms of emotional exhaustion (Maslach Burnout Inventory) in a sample of health professionals providing care for patients with COVID-19 at N.V. Sklifosovsky Institute (n=120, July)

	Emotional exhaustion		
	Beta (β)	t	The level of statistical significance p
Boredom / apathy	0.406	5.198	0.000
General level of distress	0.241	3.213	0.002
Nervousness	0.270	3.434	0.001
Disagreement with management / mistrust	0.168	2.546	0.013

As you can see from the Table. 13 the most statistically significant factors influencing the level of emotional exhaustion were boredom, general level of distress, nervousness and disagreement with management. As you can see, disagreement with management as a factor of distress is consistently found in all regressions, but everywhere it is the least statistically significant factor. The model explains 62% of the variance ($R2 = 0.623$; $F = 37.125$; $p <0.001$) of the dependent variable "emotional exhaustion".

The regression model was applied to assess the effect of distress factors on the severity of depersonalization, however, the effect on the variance of the dependent variable was significantly less. Among the distressing factors, only boredom affects the level of depersonalization, which may be due to the fact the monotony of work and the similarity of symptoms lead to the fact patients begin to be perceived as impersonal. Model explains 15% of variance ($R2=0,150$; $F=16,383$; $p<0,001$).

The influence of distress factors (the "Thermometer of distress" method) on the severity of the reduction of professional achievements was also investigated (Questionnaire of professional burnout by K. Maslach). Difficulties communicating with patients negatively affect the feeling of one's own success. By contrast, worrying about family members has a positive impact. Perhaps anxiety for loved ones leads to a sense of the seriousness of the moment, their responsibility and the importance of medical work and their place in it, which increases the feeling of professional success. Model explains 12% of variance ($R2=0,118$; $F=6,165$; $p<0,001$).

We also studied the influence of protective factors on the symptoms of emotional maladjustment and professional burnout. It should be noted that the studied factors do not have a statistically significant effect on the severity of depressive and anxiety symptoms, as well as on emotional exhaustion.

Material incentives have a positive effect on the severity of depersonalization, which can be explained by a decrease in other types of motivation during depersonalization, which is also called professional cynicism.

However, support from the administration and gratitude from patients have a positive effect on reducing the severity of depersonalization. This again points to the importance of the quality of human relationships and support from people in preventing burnout. Model explains 17% of variance (R2=0,167; F=6,201; p<0,001).

Family support is the only protective factor that has a positive effect on the feeling of one's own success. The regression model explains 11% of the variance (R2 = 0.110; F = 11.777; p <0.001) of the dependent variable "professional success". Although the variance is small, it shows how important it was for health workers to have a positive assessment and understanding of family responsibility for their work.

DISCUSSION OF THE RESULTS

The surveyed sample of 120 employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, caring for patients with COVID-19, is characterized by relatively low rates of depression against the background of available international data on the risks of medical workers in various countries. Thus, 8.3% of the sample have symptoms of depression of moderate and severe degrees of severity according to the Beck Depression Scale, while in a number of foreign studies, high rates of depression symptoms are noted in about a third of the surveyed [9, 10]. At the same time, the presence of suicidal thoughts in 6.5% of the surveyed almost completely corresponds with the data of Chinese colleagues. [15, 16] and requires close attention to the condition of medical workers and thinking through a system of measures for their recovery after extreme stress. This is evidenced by the high indicators of anxiety on the Beck anxiety scale, comparable with foreign data. [9, 10]. Young women were most at risk of developing depressive and anxiety symptoms, which also correlates with the data of other researchers.

It should be noted a high level of emotional exhaustion, indicating extreme fatigue and unwillingness to work, is noted in 35% of the surveyed, which is lower than the indicators mentioned in international studies [11]. High indicators on the depersonalization scale are striking – more than half of the employees (56,7%). Formalized contact with patients, lack of emotional involvement in work can be a way of protection in conditions of extreme stress, physical fatigue and emotional exhaustion, but this reduces the availability of emotional support from other people, which, according to numerous studies, is the most important protective factor for mental health. It is important that the gratitude from the patients and the support of the management to some extent contribute to the reduction of depersonalization. An important factor in the feeling of professional success turned out to be support from the family – care and recognition of the importance and difficulties of the mission of a medical worker in a pandemic.

More than a third (39.2%) of employees reported a low level of distress (from 0 to 3 points out of 10 possible) and almost half (49.5%) – an average level (from 4 to 7 points out of 10 possible). High levels of distress were most often reported by women (nurses and doctors) younger than 40. Anxiety for family members (noted by 54.7% of the sample) and fear of infection (noted by 38.3% of the sample) were most often named as an important factor of distress in the entire sample of 120 people. The most significant protective factors (reducing the level of distress), noted by more than half of the employees, were the following: information from the management about the current situation and tasks (54.6%), support from the family (66.7%), peer support (59.2%), financial incentives (58.3%) and the opportunity to take rest breaks (62.5%).

The aim of the study was to compare the indicators of medical workers participating in care for patients with COVID-19, obtained during the first stage of the pandemic in March-April 2020 (in a mixed sample from different medical institutions and different regions of Russia), and on a sample of employees surveyed in July at N.V. Sklifosovsky Institute. The samples were comparable by sex and age, more than half in them were doctors. However, an important limitation for comparison and possible conclusions regarding the dynamics of indicators in the course of a pandemic is the assignment of samples to different organizations (according to the data of all studies, the organization of work is the most important factor in influencing the state of medical staff) and the heterogeneous composition (in the sample of N.V. Sklifosovsky Institute, 40% were nursing staff, and in the mixed sample, there were 29.2% of interns and only 9% were nurses). Given this limitation, significant differences can be noted in all indicators of mental distress (depression, anxiety, general level of distress and professional burnout), which are much more unfavorable in the mixed sample. It is also noteworthy that in a mixed sample, specialists are almost twice as likely to experience stress due to unwillingness to go to work, 3 times more often they complain about mistrust in management and 10 times more often about a lack of PPE.

The aim of the study was also to assess the degree of influence of various factors on the indicators of mental ill-being of medical personnel of the N.V. Sklifosovsky Institute. For this, a series of regression analyzes was carried out. An important role in the increase in the incidence of symptoms of depression, anxiety and emotional exhaustion is played by negative emotional states (boredom, apathy, sadness, anger, nervousness), which accumulate in medical workers during periods of extreme stress, often monotonous and tedious, but associated with increased danger and uncertainty. This indicates the importance of carrying out activities for psychological relief and stress reduction. Unfortunately, only a fifth of the staff noted that they used special breathing and other exercises with proven effectiveness in reducing stress levels and specially prepared by the psychological service of the Institute in handouts. Lack of protective equipment and physical discomfort associated with PPE use and lack of sleep are important contributors to anxiety. A certain (albeit less significant) role in the growth of all these indicators of mental distress is played by disagreement with the management, which indicates the great importance of explaining to the staff the meaning of all measures and decisions taken and collegial discussion of the organization of work to achieve mutual understanding. Analysis of the influence of protective factors also indicates the importance of the quality of relationships between people and the level of interpersonal support for reducing the risks of mental ill-being.

FINDINGS

1. As the analysis of current international data shows, during the COVID-19 pandemic, there is a significant increase in symptoms of depression, anxiety, distress and burnout among healthcare workers in different countries. If, according to a number of data, the indicators of depression decrease slightly, which can be explained by adaptation to the situation, the indicators of anxiety remain quite high and the indicators of emotional exhaustion increase. Researchers note the importance of studying the dynamics of the state of medical workers, since the consequences of such chronic fatigue and mental stress can be very serious for the physical and mental health of doctors. Several studies highlight the necessary measures to reduce the level of distress. Among them, the importance of psychological assistance is also indicated, including the availability of a variety of psycho-educational materials.

2. In the surveyed sample of 120 employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, participating in providing care to patients with COVID-19, gender and age turned out to be statistically significant factors influencing indicators of mental distress. All these indicators are more often higher in women, as well as in young people (up to 28 years old), which is fully consistent with international data. There were no statistically significant differences between the indicators of emotional maladjustment, professional burnout and distress among doctors and nurses.

3. In the surveyed sample of 120 employees of the N.V. Sklifosovsky Research Institute, involved in providing care to patients with COVID-19, symptoms of moderate and severe depression are observed in 8.3% of employees, 6.7% employees have suicidal thoughts, 30.2% have high rates of anxiety, and 35% employees – pronounced emotional exhaustion. These indicators are generally comparable with international data and indicate the need to develop a system of measures to restore the mental and physical health of medical personnel and prevent the risks of further maladjustment. High rates of depersonification are noteworthy (in 57.2% of the surveyed). Such a high formalization of contacts with patients can be a way of protection in situations of extreme stress, physical fatigue and emotional exhaustion, but, according to numerous data, it is dangerous by a decrease in the quality of relationships with people and the level of interpersonal emotional support – the most important factor in mental health.

4. Anxiety for family members (noted by 54.7% of the sample) and fear of infection (noted by 38.3% of the sample) were named most often as an important factor of distress in the entire sample of 120 employees. More than half of the employees identified the following as the most statistically significant protective factors (reducing the level of distress): information from the management about the current situation and tasks (54.6%), support from the family (66.7%), peer support (59.2%), financial incentives (58.3%) and the opportunity to take rest breaks (62.5%).

5. A sample of 120 employees of the N.V. Sklifosovsky Research Institute for Emergency Medicine, involved in providing care to patients with COVID-19, has more favorable indicators of symptoms of mental distress compared to a mixed sample from different medical institutions and regions of Russia, surveyed in March-April 2020 with a similar set of methods. The samples also differ in the factors of distress identified by the participants: there are almost 2 times fewer employees at the N.V. Sklifosovsky Institute, in comparison with the mixed sample, experience stress due to unwillingness to go to work (20.8% versus 39% in the mixed sample), exactly 3 times less stress due to mistrust in management (15% versus 45% in the mixed sample) and, finally, employees at the N.V. Sklifosovsky Institute have more than 10 times less stress due to lack of PPE (4.2% versus 48% in a mixed sample). The limitations of such a comparison in terms of the dynamics of health workers' indicators during a pandemic are differences in the composition of the samples and their organizational affiliation.

6. Analysis of the influence of various factors on the level of mental health problems of physicians showed the importance of carrying out measures for psychological relief and reducing the level of stress, high provision of protective equipment and ensuring safety for family members, reducing the level of physical discomfort associated with the use of personal protective equipment and lack of sleep, as well as the importance of explaining to the staff the meaning of all measures and decisions taken and collegial discussion of the organization of work to achieve mutual understanding. The quality of support from relatives and colleagues, as well as good organization of work and support from the administration, contribute to maintaining a sense of the importance of one's profession and self-respect for oneself as a professional. Analysis of the influence of protective factors indicates the importance of the quality of relationships between people and the level of interpersonal support for reducing the risks of mental ill-being.

7. Based on the totality of foreign and Russian data samples, it is necessary to note the high level of stress and professional burnout among medical workers during a pandemic, as well as the importance of studying the level of emotional maladjustment of medical personnel in dynamics. Although the data obtained in July on a sample of specialists from the N.V. Sklifosovsky Institute are more favorable than the data of a mixed sample of specialists surveyed at the beginning of the pandemic, this cannot be explained by a decrease in stress or a decrease in the workload of doctors in the summer, since the accumulation of fatigue plays a large role in the level of distress. A good level of work organization can be an important factor in reducing the indicators of mental distress (see conclusion 5). In foreign studies during previous epidemics, the risks to the mental health of medical personnel are emphasized even after the end of the epidemic situation, which means the need to take special measures for the physical and psychological recovery of medical personnel and the allocation of organizational and material resources.

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