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## PSYCHOSOMATIC DISORDERS (DISTRESS, DEPRESSION, ANXIETY, SOMATIZATION) IN YOUNG PATIENTS WHO HAVE HAD COVID-19

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**AIM:** The mission is to assess possible psychosomatic disorders (in particular, stress as a nervous breakdown, an acute temporal phase of a specific disorder, which is manifested primarily by signs of depression and neurosis) in young patients who have had COVID-19, in the course of rehabilitation, to improve medical and psychological support after their discharge from the hospital.

**MATERIALS AND METHODS:** 60 convalescents who have had COVID-19 and had practically been healthy before (men aged  $19.87 \pm 1.64$  years) were examined. The main clinical variants and manifestations of COVID-19 in our study were inapparent infection (II) — in 19 cases (31.67%), acute respiratory viral infection (ARVI) — in 21 cases (35.0%), pneumonia without respiratory failure (P) — in 20 cases (33.33%). These are clinical variants and manifestations of mild-to-moderate of COVID-19 severity. The diagnosis of all clinical variants and manifestations of COVID-19, the patients' examination, treatment and discharge from the hospital were carried out in accordance with regulatory documents. The patients were examined 6–8 month after discharge from the hospital. Psychometric examination of these individuals to separate their clinical manifestations of distress and somatization and manifestations of depression and anxiety was carried out according to the questionnaire “The Four-Dimensional Symptom Questionnaire”, 4DSQ), developed in 1996 by the Dutch specialists B. Terluin. This questionnaire was translation into Russian and adapted by A.B. Smulevich et al. [2014]. Voluntary informed consent was obtained from each of the patients before their participating the study.

**RESULTS:** Indicators of distress, anxiety, somatization after all the clinical variants and manifestations of COVID-19 have a moderately increased level, which indicates a serious illness that has been suffered, in some cases with an unfavorable outcome. The strongly increased level of depression in our study is probably due to the presence of astheno-neurotic syndrome due to the previous COVID-19 disease. The data on the correlation between the scales of methods indicate the direction of possible psychoprophylactic work with convalescents.

**CONCLUSIONS:** The results of the study showed that young patients without concomitant diseases who have had COVID-19, even with a mild and low-symptom course, may develop psychosomatic consequences such as distress, anxiety, somatization and some others. The reasons, duration, potential risk factors for their development require further study, however, timely developed preventive and therapeutic and diagnostic measures, taking into account the individual characteristics of the patient, can have a positive effect.

**Keywords:** COVID-19; young patients; psychosomatic disorders; 4DSQ questionnaire; distress; depression; anxiety; somatization; rehabilitation.

## ПСИХОСОМАТИЧЕСКИЕ НАРУШЕНИЯ (ДИСТРЕСС, ДЕПРЕССИЯ, ТРЕВОГА, СОМАТИЗАЦИЯ) У ЛИЦ МОЛОДОГО ВОЗРАСТА, ПЕРЕНЕСШИХ COVID-19

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**Цель исследования** — оценить возможные психосоматические нарушения, такие как нервный срыв, острая временная фаза конкретного расстройства, которое проявляется в первую очередь признаками депрессии и невроза, у лиц молодого возраста, перенесших COVID-19, в процессе реабилитации для улучшения медико-психологического сопровождения после выписки из стационара.

**Материалы и методы.** Обследованы 60 ранее практически здоровых реконвалесцентов, перенесших COVID-19, мужчины в возрасте  $19,87 \pm 1,64$  года. Основными клиническими формами COVID-19 в нашем исследовании были инapparантная форма болезни (19 человек, 31,67 %), острая респираторная вирусная инфекция (21 человек, 35,0 %), пневмония без дыхательной недостаточности (20 человек, 33,33 %), которые имели легкую и среднюю степень тяжести течения болезни. Диагностику всех клинических случаев COVID-19, обследование, лечение и выписки больных из стационара проводили в соответствии с нормативными документами. После выписки из стационара у обследованных лиц прошло в среднем 6–8 мес. Психометрическое обследование для разделения у них клинических проявлений дистресса, соматизации, проявлений депрессии и тревоги было выполнено по опроснику The Four-Dimensional Symptom Questionnaire – 4DSQ, разработанному в 1996 г. голландскими специалистами [переведен на русский язык и адаптирован под названием «Четырехмерный опросник по симптомам дистресса, депрессии, тревоги и соматизации (4ДДТС)»]. У всех обследованных было получено добровольное информированное согласие на участие в исследовании.

**Результаты и обсуждение.** Уровень дистресса, тревоги, соматизации после COVID-19 был умеренно повышен, что свидетельствует о перенесенном серьезном заболевании, в ряде случаев имеющем неблагоприятный исход. Значительно повышенный уровень депрессии в нашем исследовании обусловлен, вероятно, наличием астено-невротического синдрома вследствие перенесенной COVID-19. Данные по корреляции между шкалами методик указывают на направление возможной психопрофилактической работы с реконвалесцентами.

**Заключение.** Результаты исследования показали, что у молодых пациентов без сопутствующих заболеваний, перенесших COVID-19, даже при легком и малосимптомном течении, могут развиваться такие психосоматические последствия, как дистресс, тревога, соматизация и некоторые другие. Причины, продолжительность, потенциальные факторы риска их развития необходимо в дальнейшем изучать, тем не менее своевременно проведенные профилактические и лечебно-диагностические мероприятия, учитывающие индивидуальные особенности пациента, могут оказать положительное влияние.

**Ключевые слова:** COVID-19; лица молодого возраста; психосоматические расстройства; опросник 4ДДТС (4DSQ); дистресс; депрессия; тревога; соматизация; реабилитация.

## Background

At the end of 2019, an outbreak of a new coronavirus infection occurred in the People's Republic of China with the epicenter in Wuhan (Hubei province). On February 11, 2020, the World Health Organization assigned the official name of this infection as coronavirus disease-2019 (COVID-19), and the International Committee on Taxonomy of Viruses concurrently assigned the official name as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) to the causative agent of the disease [1].

The COVID-19 pandemic is believed to identify and cause-specific stressors that negatively affect the mental health of the population as follows:

- potential life-threatening situation with an uncertain duration;
- high risk of getting infected for oneself and caregivers/family members;
- limited access to medical services and care due to physical or mental disease;

- nonspecific symptoms of infection, uncertain incubation period, and possible asymptomatic transmission; insufficient understanding of the transmission routes of SARS-CoV-2;
- large-scale quarantine measures (forced self-isolation);
- uncertainty associated with the impact of the coronavirus infection generally on the economic situation and particularly the family/personal budget;
- unstable information background with conflicting information [2, 3].

Emphasizing that information fatigue syndrome has all the signs of a real illness, such as stress, emotional tension, interpersonal conflicts, and functional disorders of the cardiovascular system and central and autonomic nervous systems [4].

The population of countries with a high prevalence of COVID-19 infection registered an increased number of cases of diagnostics of acute reactions to stress, including psychotic, such

as depressive, anxiety-phobic, panic, anxiety-depressive, somatoform, obsessive-compulsive (obsessive reflections and ideas reflecting current anti-epidemic measures), and post-traumatic stress disorders [5]. In the United States of America, which is one of the countries that is most affected by COVID-19, the introduction of quarantine in some territories has led not only to a surge in stress disorders among the population and the manifestation of aggression but also to an increased arms sales [3].

In 3–4 weeks of quarantine, clinically significant symptoms of adaptation disorder were noted in 21.8%, anxiety in 20.8%, depression in 17.3%, and insomnia in 7.3% of people [6]. Patients diagnosed with COVID-19 have an increased risk of suicide, which is aggravated by job loss, financial difficulties, forced self-isolation, limited social activity, family problem exacerbation, alcohol abuse, insomnia, and alarming information [7–10].

In this situation and 3 months after the infection, convalescents still have multiple symptoms, which indicates the development of the so-called post-COVID-19 syndrome [11, 12], which is called Long COVID (Europe) or Long Haulers (USA). Various authors identify up to 29 symptoms of Long COVID, including breathing problems (shortness of breath and cough), cardiovascular problems (chest tightness, chest pain, and palpitations), gastrointestinal tract (abdominal pain, nausea, diarrhea, in the elderly), lesions of the ears, nose, and throat (tinnitus, ear pain, sore throat, dizziness, ageusia, and/or anosmia), musculoskeletal (joint and muscle pain), dermatological (skin rash), and anorexia, and hyporexia general (fatigue, fever, and pain) symptoms. This aspect has become more relevant under the current active psychosocial stress, of which the impact on the human body in connection with psychogenic somatic and autonomic nervous system disorders had long been discussed by experts [13].

According to various sources, the symptomatology of these disorders is quite diverse, but the characteristic clinical presentation usually consists of a reaction from the autonomic nervous system, additional nonspecific subjective complaints, and constant references of patients to a certain organ or system as the cause of the disorder [14]. In most cases, such patients are diagnosed with depressive, anxiety, and other emotional-affective disorders [15, 16]; however,

patients with COVID-19 history revealed signs of distress, depression, anxiety, and somatization in most cases in various combinations, which requires consultation and follow-up monitoring by specialized professionals [17, 18]. Concurrently, no significant gender differences were found in the incidence of distress, somatization, depression, and anxiety [19].

Thus, at present, disorders somatization, as a condition in which physical symptoms of distress can be caused by mental, psychological, and emotional factors, is becoming more and more common in clinical practice [20]. Phobic, anxiety, and depressive mental disorders can also be “somatized” [21] since somatization in affective pathology represents a defense mechanism directed against the awareness of depressive (anxious) affect. One of the triggers of the predominance of somatized forms of emotional disorders nowadays is considered to be a psychological change of a modern individual with the rejection of mental symptoms as signs of illness (since somatization of disorders serves as a defense against “psychological pain,” which avoids the stigma of a psychiatric diagnosis), their displacement, and denial of the need to present corresponding complaints to the doctor [22].

The result summary of research on this subject formulated the concept of psychosomatic disorders [23] as a combination of symptom complexes that reflect various relationships between mental and somatic dysfunction (syndromic comorbidity).

The specialty of the doctor that is visited by patients for assistance is known to depend on the subjective sensations prevailing in the patient. However, due to the ambiguity of the boundaries of the syndromes of such dysfunction, no diagnostic and treatment algorithms were established to provide specialized medical care to these patients at the outpatient level, while the possibility of additional consultation with a psychiatrist (psychotherapist) may not always be available. This indicates the need to improve the diagnostics and treatment of patients with various types of psychosomatic disorders, which will optimize the clinical systematics and expand the range of therapeutic capabilities of therapists and neurologists.

However, these issues have not been adequately studied in patients with COVID-19 history.

**This study aimed** to assess the aspects of the problem of stress (a nervous breakdown as an acute temporal phase of a specific disorder, which is primarily manifested by signs of depression and neurosis) in young people with COVID-19 history, in the process of rehabilitation (traditionally understood as a set of measures aimed at restoring functional human capabilities and a decreased level of disability in persons with health disorders, taking into account their living conditions) to improve medical and psychological support after hospital discharge.

## Materials and methods

This study examined 60 previously healthy convalescents with COVID-19 history (males aged  $19.87 \pm 1.64$  years). In our study, the main clinical forms of COVID-19 included inapparent disease form ( $n = 19$ ; 31.67%), acute respiratory viral infection ( $n = 21$ ; 35.0%), and pneumonia without respiratory failure ( $n = 20$ ; 33.33%). All the examined patients had mild and moderate disease course severity.

The diagnosis of all clinical cases of COVID-19 was confirmed following the existing recommendations; and patients were examined, treated, and discharged from the hospital with regulatory documents [1]. No significant comorbidities were diagnosed. An average of 6–8 months passed after hospital discharge.

Psychometric examination of patients to differentiate their clinical manifestations of distress and somatization, as well as manifestations of depression and anxiety, was performed following The Four-Dimensional Symptom Questionnaire (4DSQ), which was developed in 1996 by the Dutch specialists B. Terluin et al. [15, 16, 24]. The questionnaire contains scales that set 4 dimensions, namely distress (Dis), depression (Dep), anxiety (Anx), and somatization (Som).

The Dis scale contains 16 points (total score of 0–32); the Dep scale 6 points (total score of 0–12); Anx scale 12 points (total score of 0–24); and Som scale 16 points (total score of 0–32) [15] (Table 1).

The course of work on the psychometric validation of the Russian-language version of the 4DSQ questionnaire for Dis, Anx, and Som subscales revealed some differences between the Russian and Dutch groups in assessing certain conditions. Accept higher limits for the Russian scale, namely +2 points for Dis and Anx and +4 points for Som, was suggested to make the Russian and Dutch assessments more comparable and determine the degree of symptom severity [16].

Considering distress as a nonspecific indicator of any psychological discomfort is important since its external manifestations indicate efforts aimed at maintaining psychosocial homeostasis in conditions of routine stressful situations. Concurrently, unlike depression, its manifestations lack key symptoms of affective disorder (a depressive cognitive complex of ideas of self-blame, sinfulness, suicidal thoughts and tendencies, longing affect, anhedonia, and pathological circadian rhythm), and it differs from an anxiety disorder in the absence of irrational fears, anxiety expectations and anxious rumination, signs of “pointless” generalized (floating) anxiety, and avoidance behavior. The 4DSQ questionnaire authors consider distress as stage 1 in the development of depression or anxiety disorder [15], whereas the result obtained on the Dis subscale is the most reliable indicator of social dysfunction.

Somatization includes pseudo-somatic (without medical justification) disorders that are perceived by patients as manifestations of somatic diseases; that is, the manifestation is limited in one time, but more often several polymorphic symptoms and sensations (e.g., dizziness, faint-

Table 1 / Таблица 1

Severity levels of clinical manifestations  
Уровни выраженности клинических проявлений

Clinical manifestations	Moderately increased level, points	Significantly increased level, points
Distress	>10	>20
Depression	>2	>5
Anxiety	>8	>12
Somatization	>10	>20



ing, epigastric discomfort, and conversion disorders) can be considered as a manifestation of reactive lability, which manifests itself in a stressful situation [15, 25].

Analysis of obtained responses determines the nature of the prevailing component in mental disorder structures. The possibility of evaluating the results of pharmacological intervention in patients with symptoms of distress, depression, anxiety, and somatization, as well as their combination, using the 4DSQ questionnaire, has been revealed [26, 27]. The scores on the questionnaire scales are sensitive to the changes in the patient's condition over a relatively short period [19] and can perceive and help perform primary differentiation within the four domains, which may be in different associations and degree of prevalence in different respondents (sick and healthy individuals).

This is the first psychometric study that was conducted on COVID-19 survivors.

## Results and discussion

The indicators of the scales of the 4DSQ questionnaire in young people with various COVID-19 histories are presented in Table 2.

Indicators of distress, anxiety, and somatization after all clinical forms of COVID-19 are moderately increased, which indicates a serious illness in the history, with an unfavorable outcome in some cases. Concurrently, all examined convalescents did not need additional pharmacological support or auxiliary psychotherapeutic measures.

Nowadays, depression is regarded as an inevitable attribute of modern society as a result of constant stress; however, a significantly increased level of depression in our study is probably due to the presence of astheno-neurotic syndrome

due to COVID-19 (since some loss of initiative, inertia, and a feeling of fatigue are possible forms of a person's response to the impact of stress factors of the recent psycho-traumatic situation). A temporary decrease in mood is noted in the adaptation to new (post-traumatic) living conditions. However, the revealed elements of depression did not reach clinically significant values that require pharmaceutical intervention or intensive psychotherapy.

The study of the interdependence of scale indicators in the group of the inapparent disease form revealed a strong negative correlation between the indicators Dep and Som ( $r = -0.72$ ), as well as a moderately strong correlation between the indicators Som and Dis, and Som and Anx ( $r = 0.4$  and  $r = 0.37$ , respectively). The group with acute respiratory viral infection revealed an average correlation between the indicators Som and Dis, and Som and Anx ( $r = 0.6$  and  $r = 0.58$ , respectively). The pneumonia group revealed an average correlation between the Dis and Dep indicators ( $r = -0.65$ ), and a moderate correlation between the Anx and Dep indicators ( $r = 0.29$ ).

Correlation links between other indicators in the groups were assessed as weak and very weak.

Various authors have noted that the identification of subsyndromal forms of mental disorders bears preventive and rehabilitative potential and reduces stigmatization [28] because early diagnostics and timely treatment contribute to the rapid and complete recovery of working capacity and psychological adaptation [29]. Psychometric testing is believed to help the counselor to better understand his client since it presents a picture of the personality type, as well as an idea of his personal and professional qualities [30]. Additionally, it simplifies and makes an algorithm of the diagnostic and therapeutic approaches of practicing

Table 2 / Таблица 2

Indicators of the 4DSQ questionnaire scales in young people who have undergone various forms of COVID-19 (score,  $M \pm m$ )  
Показатели шкал опросника 4ДДС у лиц молодого возраста, перенесших различные формы COVID-19 (балл,  $M \pm m$ )

Clinical form of COVID-19	Questionnaire scale			
	Dis	Dep	Anx	Som
Inapparent form	16.79 ± 1.0	6.0 ± 0.0	12.21 ± 0.35	17.26 ± 1.44
Acute respiratory viral infection	18.09 ± 1.75	6.19 ± 0.33	12.62 ± 0.71	18.67 ± 2.03
Pneumonia without respiratory failure	17.2 ± 1.38	6.0 ± 0.0	12.35 ± 0.69	17.7 ± 1.57

physicians, especially in a congested outpatient clinic. Therefore, optimized management of patients with COVID-19 history and with both autonomic disorders and manifestations of distress, depression, anxiety, and somatization is currently relevant. The study also demonstrated the need to focus on the potentially most significant factors in clinical practice that predispose to the development of psychosomatic disorders in young people with the clinical forms of COVID-19 history and apply effective approaches to their early detection and prevention.

Recently, the COVID-19 outbreak has raised many concerns, including the full range of disease severity (asymptomatic to symptomatic, mild to severe, and hospitalization to death), as COVID-19 is believed to be a new state that primarily threatens the biosafety of all countries on our planet [31].

Noting the existential experience of COVID-19 convalescents is important due to the experience of a severe disease of individuals and loved ones, loss of loved ones, and struggle with the serious illness consequences, an experience of psychological actualization of the existential closeness of the disease, death and loss, and the experience of certain people of existential sensation of a fundamental break with loved ones due to the danger of the pandemic and the need to comply with restrictive measures [32]. However, a mismatch in individual and group perceptions arise, both manifested in differences in assessing the danger of a pandemic and different attitudes toward the practice of restrictive measures (changing everyday life), as well as its socio-economic and socio-political consequences. “Corona-alarmists” (people who admit the fact of a pandemic and the existence of a virus, but believe that the measures and restrictions taken are insufficient) have appeared in our society, as well as “Corona-loyalists” (people who recognize the fact of a pandemic and the existence of a virus but consider the measures and restrictions taken as sufficient), “Corona-skeptics” (people who admit the fact of a pandemic and the existence of a virus, but believe that the assessment of the danger is exaggerated and the measures and restrictions taken are excessive), and “Corona dissidents” (people convinced of the fake nature of the virus, deny the fact of a pandemic, and negatively regard the measures and restrictions taken).

However, all these attitudes directly affect various aspects of combat against the COVID-19 pandemic, including the forms and methods of rehabilitation of convalescents. Additionally, the presence of junk information is important in COVID-19 since more than one wave of the disease may occur due to the preterm alleviation of preventive interventions [33], which will aggravate the social, financial, and economic situation everywhere; however, global efforts of disease prevention can only be effective with conditions, such as the rate and scale of COVID vaccine production, as well as global vaccination access. In this way, providing a strong foundation to combat future pandemics is possible.

### Conclusion

Therefore, our study results revealed that young patients without concomitant diseases and with COVID-19 history may develop psychosomatic consequences, such as distress, anxiety, somatization, and some others, even with a mild and low-symptom course. Their causes, duration, and potential risk factors need to be studied; nevertheless, timely preventive and therapeutic-diagnostic measures can have an obvious beneficial value. The data on the correlation between the method scales indicate the direction of possible psychoprophylactic work with COVID-19 convalescents, the nature of medical and psychological support should be at the proper level for timely identification and arrest post-COVID syndrome.

### Additional information

**Conflict of interest.** The authors declare no conflict of interest.

**Author contributions.** *I.M. Ulyukin, N.V. Kiseleva, and V.V. Rassokhin* created the concept and research plan; *I.M. Ulyukin, N.V. Kiseleva, A.A. Sechin, and E.S. Orlova* collected the data; *I.M. Ulyukin* and *V.V. Rassokhin* analyzed the data and made conclusions; *I.M. Ulyukin, N.V. Kiseleva, A.A. Sechin, V.V. Rassokhin, and E.S. Orlova* prepared the manuscript.

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