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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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PSYCHOLOGICAL FEATURES OF THE REHABILITATION OF PERSONS IN POST-COVID-19 CONDITION

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Abstract.

The global medical problem has become the COVID-19 pandemic since 2019, which represents one of the most difficult medical realities. One of the crucial medical hypotheses is the effect of SARS-Cov-2 infection on mental health that requires creation of effective psychological and psychiatric management of such patients. In connection with described above, we set the task of our research to develop and test a complex of psychological interventions in the system of psychosocial rehabilitation of patients with cognitive disorders against the background of the endured SARS-Cov-2 infection.

Materials and methods: The material of the study was the data obtained after passing the GAD-7 test for level of anxiety detection. The persons were divided into two groups with patients who have a history of severe acute respiratory syndrome of coronavirus 2 (SARS-CoV-2) and non-suffered with coronavirus. At the end of the course of psychological rehabilitation, the GAD-7 test was repeated.

Results: It was established that people who have endured COVID-19 have a significantly higher level of anxiety during examining the initial level of anxiety by performing the GAD-7 test. So, if most of the examined had a minimal level of anxiety (68%) in the control group, then after COVID-19 the majority of patients had a moderate level of anxiety (64%), and 6% even had a high level of anxiety. A month after the initial testing, the group of patients (after COVID-19) who had not undergone psychological rehabilitation was still predominantly in the zone of moderate level of anxiety (54%). Going through psychological rehabilitation had positive consequences and the majority of patients moved into the minimal level of anxiety zone (58%).

Conclusions: Majority of persons who endured COVID-19 suffer moderate level of anxiety with GAD-7 test 10.12 ± 0.43 (6.92 ± 0.33 for non-suffered). Psychological rehabilitation could reduce it to 7.24 ± 0.36 . The data obtained in the course of the work testify to the effectiveness of conducting a complex of psychotherapeutic interventions using cognitive training, cognitive-behavioral psychotherapy in the system of psychosocial rehabilitation of patients with cognitive disorders against the background of COVID-19 with reducing level of anxiety. Results provide critical information on the efficacy of psychological rehabilitation for persons who experience persistent cognitive deficits after COVID-19.

Key words. COVID-19, psychological rehabilitation, GAD-7 test, level of anxiety.

Introduction.

The global medical problem has become the COVID-19 pandemic since 2019, which represents one of the most difficult medical realities. In addition to damage to the respiratory system, the available data demonstrate multiorganic manifestations that are a consequence of SARS-Cov-2 infection [1,2]. The passed infectious disease can cause systemic disorders in the whole body and their consequences can be observed as manifestation of variable symptoms and syndromes many years later [3]. And if in the first years, the main attention of researchers was focused on measures to combat this infection, then four years after the outbreak, which claimed many lives, the attention of researchers is increasingly focused on the consequences of this disease [4,5], considering the severe consequences of infectious processes of viral aetiology [6-9].

One of significant peculiarity of SARS-Cov-2 infection is development of psychological stress as a typical emotional response to the confirmation of COVID-19 [10,11] with manifestations of feeling of suffering, indignation, and irritation, as well as signs of anxiety with possible panic attacks, phobias, insomnia, and depression with feelings of loneliness and helplessness [12,13]. COVID-19 is associated with mental manifestations, including delirium or confusion (up to 65%), excitement or agitation (up to 69%), anxiety (34%), depression (28%) and sleep problems [14,15]. The persons suffering from Alzheimer's disease and pathologies associated with dementia have an especial increased risk of the influence of COVID-19 on mental health [16]. It is important to report to yourself that cognitive disorders can manifest or imitate emotional or neuropsychiatric symptoms. And, on the contrary, complaints about cognitive functioning sometimes indicate emotional problems [17]. It is important to understand that in a pandemic situation, the psychological and mental health of people becomes the closest target for many influencing factors, physical discomfort, inability to contact the environment, material limitations, all of this is an objective factor that has a negative impact on all the main spheres of human activity. It is known that the neurotropic virus SARS-CoV-2 has a high affinity for angiotensin-converting enzyme 2 receptors, which are expressed, including on the endothelium of brain capillaries. There are several theories of the pathogenesis of brain damage in COVID-19: direct viral damage, hypoxia/ischemia and systemic inflammation, autoimmune damage; some link of its pathogenesis could be observed in other viral infections [18-20].

So, the management of patients with COVID services continuously evolving with necessary findings for improvement and inform decision as makers within the health system to better understand the lived experiences of tailor services and policies appropriately [21]. One of the crucial medical hypotheses is the effect of COVID-19 infection on the mental health that requires creation of effective psychological and psychiatric management of such patients.

In connection with described above, we set the task of our research to develop and test a complex of psychological interventions in the system of psychosocial rehabilitation of patients with cognitive disorders against the background of the endured SARS-Cov-2 infection.

Materials and Methods.

The material of the study was the data obtained after passing the GAD-7 test for level of anxiety detection [22]. The study was performed in accordance with the principles of the Helsinki Declaration of the World Medical Association "Ethical Principles of Medical Research Concerning Human Subjects" (2013) with written informed consent. The persons were divided into two groups. The first group (control group) was formed of persons who, during the year before passing the GAD-7 test, had no data about the presence of acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (50 people). The second group (investigated group) includes persons who have a history of severe acute respiratory syndrome of coronavirus 2 (SARS-CoV-2) during the month before the GAD-7 test (50 people). 25 people in each of the groups received an intensive course of psychological influence through psychological counselling using elements of cognitive and positive psychotherapy (individual counselling), a method of psychological self-regulation, and cognitive training. At the end of the course of psychological rehabilitation, the GAD-7 test was repeated.

The severe form of the acute respiratory syndrome of the coronavirus 2 (SARS-CoV-2) was diagnosed based on a complex of clinical and laboratory data [23] obtained from the medical histories of persons undergoing examination. Among the clinical and laboratory data, we selected C-reactive protein (CRP - a blood plasma protein belonging to the group of acute phase proteins, the concentration of which increases during inflammation), D-dimer (a protein fragment that is formed during the dissolution of a blood clot that occurs during blood clotting), procalcitonin (a precursor of calcitonin, which is involved in calcium metabolism and maintains its constant level in the blood) and blood oxygen saturation level (Table 1). The age in both groups ranged from 25 to 55 years (36.03 ± 4.70 and 36.48 ± 5.13 years, respectively). Male and female distribution was evenly presented in both groups.

Table 1. Laboratory findings in the group COVID-19 patients.

Parameters and their values	
C-reactive protein, mg/l	98.80±9.29
D-dimer, ng/ml	767±31.02
Procalcitonin, ng/ml	0.65 ± 0.14
Blood oxygen saturation level (%)	84.14 ± 5.83

The GAD-7 scale is a personality questionnaire for assessing the level of anxiety and screening for generalized anxiety

disorder, which can be used for screening for panic and post-traumatic stress disorder. The scale is a test of 7 questions, each of which has four possible answers. For each answer, a certain amount of points is awarded, based on the sum of which a conclusion is made about the level of anxiety. The interpretation of the questionnaire data was carried out depending on the obtained result: 0-4 points - minimal level of anxiety, 5-9 - points - moderate level of anxiety, 10-14 points - medium level of anxiety, 15-21 points - high level of anxiety [22].

Psychological counseling using elements of cognitive and positive psychotherapy (group and individual counseling) was carried out as a method of psychological influence; method of psychological self-regulation; cognitive training in accordance with previously published recommendations [11]. Classes were performed individually under the supervision of a psychologist, duration 20-25 minutes, at least 10 sessions for the rehabilitation period. Criteria for termination of the session: worsening of the patient's health and feeling of fatigue. At the same time, the patient was given recommendations to achieve a state of relaxation, to reduce the level of emotional tension, while controlling his own heart rate. Possible options for regulating the internal psychological state (elements of visualization, progressive muscle relaxation, breathing exercises, etc.) were proposed. Techniques were used, with the help of which it is possible to train the memory and attention of patients: "anagrams", "entangled lines", "Memorizing 10 words", "Memorizing visual images", "Noisy pictures", "Puzzles". Also, 3 group classes with elements of cognitive psychotherapy were conducted, the main goals of which were self-awareness and acceptance of one's illness, working through fears related to the recurrence of the disease, forming an image of the future and a picture of health.

Statistical processing of the data was performed using the Statistica for Windows 8.0 software package. Methods of descriptive statistics (determination of numerical characteristics of variables - arithmetic mean (M), mean sampling error (m), determination of the reliability of differences (p), which were tested via the Student-Fisher t-test in representative samples) were used. Correlation between indicators was assessed using Spearman's correlation coefficient (r). The difference in values between comparative indicators was considered significant at $p < 0.05$.

Results.

According to the results of the study, 54.5% of the examined in the investigated group and 22.5% of the control group had mild cognitive disorders ($p < 0.05$). Cognitive disorders of a moderate degree have been detected in 45.5% and 2.5%, respectively ($p < 0.05$). So, cognitive disorders were observed in all persons who suffered severe SARS-CoV-2. Cognitive disorders were manifested by a decrease in verbal memory (66.5% and 15.5%), concentration of attention (77.5% and 16.5%, respectively), absent-mindedness (55.0% and 14.1%, respectively), a decrease in the speed of information processing (49.5% and 5.5%, respectively), difficulty in remembering recent events (55.5% and 14.8%, respectively), difficulty in long-term concentration (62.5% and 16.5%, respectively) and slowing of the pace of thinking (44.5% and 16.0%, respectively), slight difficulty

Table 2. Level of anxiety of study groups.

GAD-7	Persons without COVID-19 (N=50)		Persons after COVID-19, (N=50)		
	Initial (N=50)	After psychological rehabilitation (N=25)	Initial (N=50)	Without psychological rehabilitation (N=25)	After psychological rehabilitation (N=25)
minimal level of anxiety, n	34	45	7	16	29
moderate level of anxiety, n	13	4	32	27	17
medium level of anxiety, n	3	1	8	6	4
high level of anxiety, n	1	-	3	1	-
average GAD-7	6.92±0.33	6.05±0.27[#]	10.12±0.43[*]	9.42±0.47	7.24±0.36[#]

Note: * - significant difference with the control group; # - significant difference with the initial level ($p < 0.05$).

in orientation (35.5% and 40.0%, respectively), a decrease in indicators of the perceptual-gnostic sphere (45.5% and 12.5%, respectively), a decrease in the speed of counting operations (55.5% and 45.5%, respectively), and a pronounced reaction of mental fatigue (75.0% and 13.5%, respectively).

It was established that people who have endured SARS-CoV-2 have a significantly higher level of anxiety during examining the initial level of anxiety by performing the GAD-7 test. So, if most of the examined had a minimal level of anxiety (68%) in the control group, then after COVID-19 the majority of patients had a moderate level of anxiety (64%), and 6% even had a high level of anxiety. A month after the initial testing, the group of patients (after COVID-19) who had not undergone psychological rehabilitation was still predominantly in the zone of moderate level of anxiety (54%). Going through psychological rehabilitation had positive consequences and the majority of patients moved into the minimal level of anxiety zone (58%). Results of the GAD-7 test for level of anxiety detection have been presented in Table 2.

When comparing the indicators of the severity of the disease and the level of anxiety, the most pronounced correlation relationship was revealed between the GAD-7 test indicator and the level of oxygen saturation (Table 3).

Table 3. Relationship between indicators of endured COVID-19 severity and level of anxiety (r).

Laboratory parameters	Values
C-reactive protein	0,49
D-dimer	0,43
Procalcitonin	0,71
Oxygen saturation	0,72

Discussion.

There is difference on the summed scales of GAD-7 for different countries, for example UK and Ireland scoring significantly lower than Spain and Italy [22,24]. But one of the main difficulties of this work was the distribution of patients by study groups as given that currently the majority of the population has contracted the coronavirus several times, including in a mild form. Therefore, the authors were not able to completely rule out the possibility of the presence of a coronavirus infection in the control group. However, if the coronavirus infection did

occur, it was in a mild form, since each person in the control group does not exclude the presence of the disease during the year before passing the test anamnestically.

On the other hand, the criteria for the severity of the coronavirus infection remain debatable, given the presence of cases with the absence of significant respiratory function disorders with low and very low saturation indicators and the presence of fatal outcomes with practically unchanged saturation [23,25]. It should be understood that cognitive changes may also be a consequence of the temporary reduction of health care service and screening programs during the pandemic, the growing informational influence of the environment.

In addition to the saturation level, among the laboratory indicators to reveal the relationship between COVID-19 and psychological status, we have chosen CRP, which is a marker of the activity of the process in the lungs as an indicator of the level of blood oxygen saturation; D-dimer is a marker of thrombogenesis, a sharp increase in the concentration of which indicates an active process of impaired blood coagulation in the form of increased thrombogenesis caused by venous thromboembolism or DIC syndrome; procalcitonin is an indicator of the presence of a bacterial infection in the body and is used to diagnose sepsis, septic complications, to assess the effectiveness of antibacterial therapy, and is often considered a marker of severe bacterial infection [26,27]. At the same time, a strong correlation relationship was revealed in the pairs Oxygen saturation - Level of anxiety ($r=0.72$) and Procalcitonin - Level of anxiety ($r=0.71$). As a result of our work, it was established that a severe form of SARS-CoV-2 causes increased anxiety.

Stressors specific to COVID-19 include fear of getting sick and dying, being socially excluded / quarantined, losing livelihood or loved ones, feelings of helplessness, boredom and loneliness due to isolation. These stressors can provoke the appearance of new symptoms or aggravate existing mental disorders in terms of the frequency and intensity of their manifestations [28,29].

Majority of patients with COVID-19 has at least one symptom associated with the previous infection for up to six months after outgoing from the hospital with a negative PCR test. So, about one of forth of those who have recovered suffer from sleep disorders, anxiety, or depression [30,31]. The most common psychological problems of this period are acute stress disorders, anxiety symptoms and symptoms of demoralization, depression and complicated grief [32,33]. Among the psychiatric

consequences of COVID-19 are depression, post-traumatic stress disorder (PTSD), somatoform pain, panic disorder, as well as chronic fatigue syndrome and impaired quality of life [34,35].

Persistent mental disorders in the form of anxiety, depression and PTSD are observed in persons who have experienced a critical course of the disease an year after COVID-19. The majority of patients with severe acute respiratory distress syndrome had a history of cognitive disorders, in particular, difficulty concentrating, impaired memory, and speed of thought processes within a year after the disease ("brain fog") [22,36].

Therefore, the medical staff should pay attention to the mental health of patients with COVID-19, regardless of the severity of the disease, and if necessary, assess individual mental functions and the likelihood of mental disorders [37,38]. During a pandemic, a biopsychosocial approach to prevention, care and treatment is necessary, even if attention is focused on the physical needs of the patient. Psychological rehabilitation provides control of the patient's psychological needs at all stages of care [30].

Perhaps one of the links of the described events is the depletion of the immune system, which can accompany the disease of COVID-19, expressed in a change in the immunological profile. In addition, an indirect pro-angiogenic and pro-inflammatory microenvironment caused by the multisystem effects of COVID-19 can play an additional role [4,22,39,40].

It is important to understand that the psychological reaction to the disease depends on the patient's personal characteristics. People who have always been characterized by anxiety, suspiciousness, and psychological inflexibility, as a rule, give a phobic or hypochondriac reaction to the disease. Persons who are prone to illness and react to life's difficulties with despair, depressed mood, disbelief in the possibility of a successful resolution of the situation, and respond to illness with a depressive reaction, etc [4,5,41]. The degree of harmony of the personality structure, its premorbid resistance to psychotraumatic situations correlates with the frequency and severity of psychopathological reactions to the disease. An important role in the process of psychological readaptation is played by individual resources and coping strategies of patients. A positive psychological effect on patients, in addition to the favourable dynamics of the somatic condition, has a reduction in the length of stay in the hospital, especially the periods of strict bed rest. Consistent expansion of the regime, physical therapy strengthen confidence in recovery, eliminate anxiety about health and fear of physical stress even with a complicated course of the disease. Therefore, it is necessary for the doctor to conduct explanatory discussions with family members to form adequate representations of the disease, ways to overcome it, and consequences among the people closest to the patient. It is important to develop common attitudes in the patient and his family members that contribute to active participation in rehabilitation programs.

Thus, our research showed that a complex of psychological measures covering the personal, emotional and cognitive spheres of patients who have suffered from COVID-19, included in the general structure of medical rehabilitation, is an important component of the rehabilitation process and allows the most effective coping with the consequences of the disease. The data obtained in the course of the work can be used to develop a

comprehensive personalized program for the correction of anxiety disorders in patients who have undergone COVID-19 with the differentiated use of psychopharmacotherapy, psychotherapy and psychoeducation methods.

Conclusion.

The majority of persons who endured COVID-19 suffer moderate level of anxiety with GAD-7 test 10.12 ± 0.43 (6.92 ± 0.33 for non-suffered). Psychological rehabilitation could reduce it to 7.24 ± 0.36 . The data obtained in the course of the work testify to the effectiveness of conducting a complex of psychotherapeutic interventions using cognitive training, cognitive-behavioral psychotherapy in the system of psychosocial rehabilitation of patients with cognitive disorders against the background of COVID-19 with reducing level of anxiety. When comparing the indicators of the severity of the disease and the level of anxiety, the most pronounced correlation relationship was revealed between the GAD-7 test indicator and the level of oxygen saturation (0,72). Results provide critical information on the efficacy of psychological rehabilitation for persons who experience persistent cognitive deficits after COVID-19. Further research utilizing a clinical trial with more biological and functional measures is warranted.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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