

<https://doi.org/10.33266/2070-1004-2022-1-44-48>
UDK 159.944.2:614.23:578.834.1

Original article
© Burnasyan FMBC FMBA

ASSESSMENT OF THE INFLUENCE OF STRESS ON THE PROFESSIONAL READINESS OF A DOCTOR

S.V. Poroisky¹, A.D. Donika¹, M.V. Eremina¹

¹ Volgograd State Medical University, the Ministry of Health of the Russian Federation, Volgograd, Russian Federation

Abstract. *The aim of the study is to determine approaches to investigate the impact of COVID-19 pandemic stress on the professional preparedness of a physician.*

Materials and research methods. Working hypothesis of the research is based on K. Maslach's model of three-dimensional structure of professional burnout. The physicians of Volgograd medical organizations took part in the study — N=112, mean age — (40,2±1,4) years, mean length of service — (6,2±1,7) years. As psychodiagnostic testing methods "Diagnosis of psychological rigidity" and "Determination of neuropsychological resistance and risk of maladaptation to stress" ("Prognoz") were used. The express interview, in which physicians of Volgograd city and Volgograd region, whose professional activity is connected with rendering of medical aid to patients with COVID-19 took part, was conducted on the basis of Google electronic platform using Google Forms (N=236). An additional questionnaire was developed for the model group of doctors, the purpose of which was to subjectively assess the respondents' opinion on the necessity of determining the preparedness of physicians for professional activity in extreme conditions.

Research results and their analysis. The results of the research showed the relevance of socio-psychological support of physicians working under extreme conditions in order to improve the quality of medical care.

Key words: COVID-19 pandemic, physicians, professional preparedness, professional stress, psychological preparedness

Conflict of interest. The authors declare no conflict of interest

For citation: Poroisky S.V., Donika A.D., Eremina M.V. Assessment of the Stress Impact on Physicians' Professional Preparedness. *Meditsina Katastrof = Disaster Medicine.* 2022;1:44-48 (In Russ.). <https://doi.org/10.33266/2070-1004-2022-1-44-48>

<https://doi.org/10.33266/2070-1004-2022-1-44-48>
УДК 159.944.2:614.23:578.834.1

Оригинальная статья
© ФМБЦ им.А.И.Бурназяна

ОЦЕНКА ВЛИЯНИЯ СТРЕССА НА ПРОФЕССИОНАЛЬНУЮ ГОТОВНОСТЬ ВРАЧА

С.В.Поройский¹, А.Д.Доника¹, М.В.Еремина¹

¹ ФГБОУ ВО «Волгоградский государственный медицинский университет» Минздрава России, Волгоград, Россия

Резюме. *Цель исследования – определение подходов к исследованию влияния стресса, вызванного пандемией COVID-19, на профессиональную готовность врача.*

Материалы и методы исследования. Рабочая гипотеза исследования базируется на модели трехмерной структуры профессионального выгорания К.Маслак. В исследовании приняли участие врачи медицинских организаций г.Волгограда – N=112, средний возраст – (40,2±1,4) лет, средний стаж работы – (6,2±1,7) лет. В целях психодиагностического тестирования применялись методики «Диагностика психологической ригидности» и «Определение нервно-психической устойчивости и риска дезадаптации в стрессе» («Прогноз»). Экспресс-опрос, в котором приняли участие медики г.Волгограда и Волгоградской области, чья профессиональная деятельность связана с оказанием медицинской помощи пациентам с COVID-19, был проведен на базе электронной платформы Google с использованием Google Formst (N=236). Для модельной группы врачей была разработана дополнительная анкета, цель которой – субъективная оценка мнения респондентов о необходимости определения готовности врачей к профессиональной деятельности в экстремальных условиях.

Результаты исследования и их анализ. Результаты исследования показали востребованность социально-психологического сопровождения профессиональной деятельности врача в экстремальных условиях для повышения качества оказания медицинской помощи.

Ключевые слова: врачи, пандемия COVID-19, профессиональная готовность, профессиональный стресс, психологическая готовность

Конфликт интересов. Авторы статьи подтверждают отсутствие конфликта интересов

Для цитирования: Поройский С.В., Доника А.Д. Еремина М.В. Оценка влияния стресса на профессиональную готовность врача // Медицина катастроф. 2022. №1. С. 44-48. <https://doi.org/10.33266/2070-1004-2022-1-44-48>

Contact information:

Sergey V. Poroytskiy – Dr. Sci. (Med.), Head of the Department of Disaster Medicine

Address: 1, Pavshikh Bortsov square, Volgograd, 400131, Russia

Phone: +7 (8442) 38-50-05/53-23-33

E-mail: pk@volgmed.ru

Контактная информация:

Поройский Сергей Викторович – доктор мед. наук, зав. кафедрой медицины катастроф

Адрес: Россия, 400131, Волгоград, пл. Павших Борцов, 1

Тел.: +7 (8442) 38-50-05/53-23-33

E-mail: pk@volgmed.ru

Introduction. The influence of stress factors connected with professional activity has long been a subject of interest of specialists in the field of medicine, psychology, sociology, etc. The coronavirus infection pandemic made the study of the problem highly relevant for the professional group of doctors, as their professionalism today determines life and health of the population.

The aim of the study is to determine the approaches to study the influence of stress caused by the COVID-19 pandemic on the professional preparedness of a physician.

Research objectives:

1. Based on the review of domestic and foreign literature to show the relevance of the problem under consideration.

2. To determine the possibility of application of the methods used in the course of psychodiagnostic diagnostics with the aim to evaluate the socio-psychological preparedness of doctors to work in pandemic.

Materials and research methods. Scientific publications posted on eLIBRARY.RU, CrossRef, Google Scholar, PubMed, Scopus, etc. were used for literature review.

Doctors of medical treatment organizations of Volgograd took part in the study: N=112, mean age – (40.2±1.4) years, mean length of service – (6.2±1.7) years. According to the working hypothesis, assessment of the impact of COVID-19 pandemic stress in its ongoing spread cannot be reliable due to the incompleteness of the process by the time of the study. Thus, psychodiagnostics of physicians involved in the care of patients with COVID-19 creates an additional burden on the professional group and therefore seems unethical. Therefore, we used data obtained from psychodiagnostic testing of emergency medical teams doctors in the pre-pandemic period (November 2019). These are the doctors whose professional activity is associated with increased stress corresponding to pandemic conditions (uncertainty factor, need for emergency decisions, reaction to patient mortality, complex work schedule, etc.), which allows us to consider them as a model group. Volgograd medical treatment organisations general practitioners were involved as a control group. Confidentiality norms were observed in relation to the respondents.

For psychodiagnostic testing the methods "Diagnostics of psychological rigidity" and "Determination of neuropsychological stability and risk of desadaptation under stress" ("Forecast") [1] were applied. The method "Diagnosis of psychological rigidity" allows to identify a high level of rigidity, which indicates the usage of protective mechanisms under the influence of professional stressors, accompanied by a shortage of time, and complicates the decision-making process. Rigidity reaction as a stable personal characteristic interferes with the formation of mental readiness in the situation of changes in the external environment. And, thus, it reduces the abilities of implementing the professional role of the doctor [1].

The "Forecast" ("Prognoz") method for determining the neuropsychological stability and risk of maladaptation in

stress developed at the Kirov Military Medical Academy for the professional selection of doctors involved in emergency situations has shown sufficient validity and informativeness in numerous studies [2, 3].

According to the working hypothesis of our study, the selected techniques involve the use of oppositely directed assessment scales, allowing to determine the personal qualities of the study group in gradations "+" and "-" in the context of resistance to stressogenic factors.

The express survey was conducted on the basis of Google electronic platform using Google Forms (N=236). Medical specialists of Volgograd city and Volgograd region, whose professional activity is connected with rendering medical care to patients with COVID-19, took part in the survey.

An additional questionnaire was developed for the model group of doctors. It's purpose was the subjective evaluation of respondents' opinion on the necessity to determine doctors' readiness for professional activity in extreme conditions.

In the study we analyzed a publicly available questionnaire developed at Stanford University to assess the impact of stress caused by COVID-19 pandemic.

The data were mathematically processed by methods of variance statistics, calculating parametric (Student t-criterion) criteria of variance using the Excel for Windows Statistica 17.0 software package.

Results of the study and their analysis. The analysis of modern scientific research data has shown a significant influence of professional stress on the realisation of the doctor's professional role. The data refers to the three-dimensional structure of professional burnout syndrome by K. Maslak including emotional exhaustion, depersonalization and personal achievements decrease [4]. Emotional exhaustion is manifested by fatigue (doctors have "compassion fatigue"), somatic symptoms, decrease of emotional resources and characterizes a state of emotional overstrain that turns into exhaustion. Depersonalization of doctors manifests itself in a negative, impersonal, cynical attitude toward patients. A decrease in personal achievements means a feeling of incompetence and ineffectiveness of professional activity [5].

Symptom manifestation and formation of professional burnout syndrome phases determine the degree of professional stress influence on professional role realization – from initial manifestations to the symptoms of emotional detachment and depersonalization [6]. In addition, the manifestation of the exhaustion phase is expressed by psychosomatic symptoms reducing the professional functionality of doctors. A number of publications report that physicians experiencing a burnout are subjected to a higher risk of erroneous judgment or medical errors, refusal to work, demonstration of hostility towards patients, as well as to a higher risk of conflicts within the team [7].

Some aspects of the prevalence of professional burnout syndrome among physicians have been assessed differently in foreign studies. For example, publications in the United

States report a higher prevalence of professional burnout syndrome among female physicians, while European studies report the opposite trend, i.e., a higher prevalence of professional burnout syndrome among men [8, 9]. In general, foreign works show the influence of a number of demographic factors on the increased risk of professional burnout syndrome, such as young age, female gender, unstable marital status, long working hours, and low level of job satisfaction [10].

A number of studies have shown a more pronounced resistance to the influence of occupational stress in doctors with a higher level of satisfaction with their medical practice — dermatologists, pediatricians, specialists in preventive medicine, obstetrics and gynecology. Interestingly, a number of studies also showed that specialists in general surgery and therapy, despite the lowest work-life balance satisfaction indexes, had lower than average burnout indexes. Whereas specialists, for example, in neurology, with high burnout indexes were not necessarily the least satisfied with their work [11]. This allows to conclude that achieving a work-life balance or increasing job satisfaction can counteract a burnout and, hence, determine psychotherapeutic strategies of burnout management in doctors.

Despite the discrepancies in the data on certain indicators, the observed prevalence of professional burnout syndrome in the professional group of doctors is of an international nature, which allows us to use the data of foreign researchers to design research tasks in Russian realities.

The modern scientific works determine the risk factors of professional burnout syndrome. They include not only those related to saving life and health (feeling of helplessness, frustration, professional failures), but also those of organizational nature (bureaucracy, necessity of constant improvement of knowledge and skills in conditions of rapidly developing medical technologies, compulsory informatization of medical reporting, etc.). Thus, the impact of professional stressors occurs not only within the doctor-patient relationships, but also outside them. So, in the publication of the World Medical Association it was noted: "In many countries doctors experience great disappointment in professional practice both because of limited resources, governmental or corporate management, and because of sensational media reports about medical errors and unethical behavior of doctors or their professional incompetence...". [12: c.14].

The situation is much similar in Russia. On the eve of the coronavirus pandemic there was an aggressive media attitude towards doctors, provoking the growth of patients' dissatisfaction with the quality of medical care provided. It should be noted that in Russia, perhaps more than in any other country, during the pandemic the position of the mass media sharply changed in the direction of glorification of the medical profession against the background of the obvious growth of doctors' authority. At the same time, the effect of stress has a prolonged effect, and the positive effect of 2-3 months cannot absolutely neutralize the previous information pressure.

Our express survey using Google Forms service (N=236) confirms the influence of COVID-19 pandemic as a stress factor on the professional activity of doctors. When asked, "Do you consider the impact of the COVID-19 spread to be a stressor?" 100% of respondents gave a positive answer. At the same time, when answering the question, "Do you think that the COVID-19 proliferation stress negatively affects

your professional activity?" the respondents' opinions were distributed as follows: 37.3% thought "negatively affects"; 58.9 thought "does not affect"; and 3.7% thought "rather mobilizes", $p < 0.5$.

The results of testing physicians using the Diagnostic of Psychological Rigidity technique did not reveal statistically significant differences between the average rigidity values of the model (30.19 ± 2.04) and control (30.05 ± 2.49) groups (table).

Таблица / Table

Среднее значение ригидности у врачей модельной и контрольной групп
The average value of the rigidity of doctors in the model and control groups

Группа врачей Groups of doctors	Среднее значение ригидности, $M \pm \sigma$ The average value of the rigidity, $M \pm \sigma$	
	психотип «ригидный» "rigid" psychotype	проявляет черты ригидности — не сформировавшийся психотип / exhibits rigidity traits — unformed psychotype
Модельная Model group	30,19±2,04	23,73±2,6
Контрольная Control groups	30,05±2,49*	24,17±2,36*

* $p < 0,05$ между показателями в группах / between indicators in groups

At the same time, according to the distributional analysis, a high level of rigidity was observed in 32.7% of doctors in the model group and in 57.1% in the control group, $p > 0.5$. In both groups, the average gradations of the index prevail — 58.8 and 57.1%, respectively, $p > 0.5$. Among women, the traits of rigidity manifested: in the control group — 76.9%, in the model group — 61.2%. In the control group, 65.2% of men and 23.1% of women possess rigidity traits, $p < 0.01$. For the model group, the indicated values were 45.1 and 38.7% for men and women, respectively, $p > 0.5$.

The results of testing according to the "Forecast" technique showed that the majority of the examinees in both groups had levels of neuro-psychological stability of the gradation "average" or higher. The average score on the NPU scale ($M \pm m$) was $13,8 \pm 0,74$ in all the examinees and had no significant differences in the groups, $p > 0,05$.

At the same time, the distributional analysis revealed reliable differences between individuals with different levels of neuropsychological stability in the groups. Thus, the model group revealed fewer individuals with a low level of neuropsychological stability than the control group - 8,2%; $p < 0,01$. The majority of physicians in the model group had an "above average" level of neuropsychological stability - 74.3%; $p < 0.05$. At the same time, in the control group, approximately half of the examinees had levels of neuropsychological stability of average and above average — 49.2%: 42.4% — average level, 6.8% — above average, $p < 0.5$.

A survey of physicians in the model group showed that most of them (87.8%) believe that not every physician can effectively perform their professional functions in extreme conditions. At the same time, 56,7% of respondents noted that in order to work in such conditions a doctor must have specific personal qualities, and 47,8% of respondents believed that such qualities are formed as a result of professional training. Of interest is the fact that the doctors in the model group almost unanimously denied a gender approach to the problem in question. Thus, to the question

"Do you think that female doctors are more sensitive to stress and therefore less prepared to work in extreme conditions?" 89.2% of respondents chose the answer options "no" and "more likely no than yes." Physicians were also unanimous in recognizing the advisability of socio-psychological monitoring of professional activity in extreme conditions in order to prevent and to timely diagnose psychosomatic reactions to stress — 92.3%.

Thus, the influence of stress associated with the professional activity of the doctor is clearly demonstrated by the high prevalence of professional burnout syndrome noted in modern studies. Its symptomatology and severity characterizes the influence of stress on the realization of the professional role — from "compassion fatigue" to "cynical attitude towards patients". Currently, physicians themselves note the influence of an additional stressor caused by the spread of coronavirus infection. In this connection, an important element in improving the quality of medical care in the current realities is the diagnosis of doctors' preparedness for professional activity in extreme conditions.

Our study has shown that doctors choose their professional field in accordance with their personal characteristics. In the model group of doctors, whose activity is associated with higher neuro-emotional stress, individuals with a high level of neuro-psychological stability and less often individuals with high levels of rigidity, exhibiting excessive emotional impressionability and inability to self-regulate under stressful conditions are observed more frequently.

At the same time, in the model group there were observed from 8.5 to 32.7% of persons with personality traits indicators that do not meet the requirements for the implementation of the professional role in extreme conditions, which allows

to predict an increase in the number of doctors with professional burnout syndrome and other signs of professional maladaptation in pandemic conditions.

To detect COVID-19 stress, a Stanford University-based questionnaire with the ability to progressively fill the database and to statistically process it online has been developed [13]. The questionnaire is the result of a collaboration with the Stanford Department of Neurosurgery and the Stanford Department of Psychiatry; the development team was led by Dr. Maheoo Mausoo Adamson. The developers stated the purpose of the survey was to measure stress levels during the pandemic, with the ability to describe them according to location, gender, income, occupation and other factors — homeschooling, full-time remote work, social distancing, etc. The proposed Coronavirus Anxiety Scale (CAS) is a self-assessment psychoanalytic screening of dysfunctional anxiety associated with the spread of coronavirus, identifying symptoms that may require further assessment or treatment. A separate block of questions is related to professional activity, which suggests the emergence of data on the impact of the stress on the professional group of doctors as well, taking into account a number of socially conditioned criteria.

Conclusion

1. The authors consider, that for increase of efficiency of medical aid rendering in the conditions of pandemic, the psychodiagnostic techniques allowing to estimate both resistance to stress and readiness for work under stress are in great demand.

2. The application of the techniques considered in our work will make it possible to screen doctors for work in the "red zone", which is especially relevant in the case of the predicted second wave of coronavirus infection.

СПИСОК ЛИТЕРАТУРЫ

1. Райгородский Д.Я. Практическая психодиагностика. Методики и тесты: Учебное пособие. Самара: Издательский Дом БАХРАХ-М., 2015. С. 672–688.
2. Поройский С.В. Готовность врача скорой медицинской помощи к профессиональной деятельности в экстремальных ситуациях // Волгоградский научно-медицинский журнал. 2015. №1. С. 8–10.
3. Donika A.D., Poroykiy S.V., Eremina M.V. Methods of evaluation of neuro-psychological stability for the diagnostics of prenozoological status in extreme conditions. International Journal of Pharmacological Research. 2019. T. 11. С. 184–187.
4. Maslach C., Jackson S. Burnout Inventory manual. 2nd ed. Consulting Psychologist Press; Palo Alto, CA, USA: 1986. [Электронный ресурс]: Режим доступа: https://scholar.google.com/scholar_lookup?title=Maslach+Burnout+Inventory+manual&author=C.+Maslach&author=S.+Jackson&publication_year=1986 (Дата обращения: 12.05.2020).
5. Корехова М.В., Соловьев А.Г., Киров М.Ю. Синдром профессионального «выгорания» у врачей анестезиологов-реаниматологов // Вестник анестезиологии и реаниматологии. 2016. Т.13. С. 19–27.
6. Синбухова Е.В., Лубнин А.Ю. Эмоциональное выгорание врачей анестезиологов-реаниматологов // Акмеология. 2018. Т.4. С. 60–67.
7. Balch C.M., Freischlag J.A., Shanafelt T.D. Stress and burnout among surgeons: Understanding and managing the syndrome and avoiding the adverse consequences. Arch. Surg. 2015; 144: 371–376.
8. Dyrbye L.N., Shanafelt T.D., Balch C.M., Satele D., Sloan J., Freischlag J. Relationship between work-home conflicts and burnout among American surgeons: A comparison by sex. Arch. Surg. 2015; 146: 211–217.
9. Soler J.K., Yaman H., Esteva M., Dobbs F., Asenova R.S., Katic M., Ozvacic Z., Desgranges J.P., Moreau A., Lionis C., et al.

REFERENCES

1. Raygorodskiy D.Ya. *Prakticheskaya Psikhodiagnostika. Metodiki i Testy* = Practical Psychodiagnos-tics. Methods and tests. Tutorial. Samara, Bakhrahk-M Publ., 2015. P. 672-688 (In Russ.).
2. Poroykiy S.V. Preparedness of an Emergency Doctor for Professional Activities in Extreme Situa-tions. *Volgogradskiy Nauchno-Meditsinskiy Zhurnal* = Volgograd Journal of Medical Research. 2015; 1:8-10 (In Russ.).
3. Donika A.D., Poroykiy S.V., Eremina M.V. Methods of Evaluation of Neuro-Psychological Stability for the Diagnostics of Preno-zological Status in Extreme Conditions. International Journal of Pharmaceuti-cal Research. 2019; 11; 1:184-187.
4. Maslach C., Jackson S. Burnout Inventory Manual. 2nd ed. Consulting Psychologist Press; Palo Alto, CA, USA: 1986. Available at:https://scholar.google.com/scholar_lookup?title=Maslach+Burnout+Inventory+manual&author=C.+Maslach&author=S.+Jackson&publication_year=1986 (date of access: 12 May, 2020).
5. Korekhova M.V., Solovyev A.G., Kirov M.Yu. Syndrome of Professional "Burnout" by Anesthesiol-ogists-Resuscitators. *Vestnik Anesteziologii i Reanimatologii* = Messenger of Anesthesiology and Resusci-tation. 2016; 13;3:19-27 (In Russ.).
6. Sinbukhova E.V., Lubnin A.Yu. Emotional Burnout of Resusci-tation Anesthetists. *Akmeologiya*. 2018;4:60-67 (In Russ.).
7. Balch C.M., Freischlag J.A., Shanafelt T.D. Stress and Burnout Among Surgeons: Understanding and Managing the Syndrome and Avoiding the Adverse Consequences. *Arch. Surg*. 2015; 144:371–376.
8. Dyrbye L.N., Shanafelt T.D., Balch C.M., Satele D., Sloan J., Freischlag J. Relationship between Work-Home Conflicts and Burnout among American Surgeons: A Comparison by Sex. *Arch. Surg*. 2015; 146:211–217.
9. Soler J.K., Yaman H., Esteva M., Dobbs F., Asenova R.S., Katic M., Ozvacic Z., Desgranges J.P., Moreau A., Lionis C., et al. Burnout in European Family Doctors: The EGPRN Study. *Fam. Pract*. 2015;25:245–265.

Burnout in European family doctors: The EGPRN study. *Fam. Pract.* 2015; 25: 245–265.

10. Amofo E., Hanbali N., Patel A., Singh P. What are the significant factors associated with burnout in doctors? *Occup. Med.* 2015; 65: 117–121.

11. Shanafelt T.D., Boone S., Tan L., Dyrbye L.N., Sotile W., Satele D., West C.P., Sloan J., Oreskovich M.R. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch. Intern. Med.* 2015; 8: 1377–1385.

12. World Medical Association Medical Ethics Manual - 2nd Edition. [Электронный ресурс]: Режим доступа: http://www.wma.net/en/30publications/30ethicsmanual/pdf/chap_6_en.pdf. (Дата обращения: 10.05.2020).

13. Maheen Adamson. Psychological Stress Associated with the COVID-19 Crisis. [Электронный ресурс]: Режим доступа: https://www.nlm.nih.gov/dr2/Psychological_Stress_Associated_with_the_COVID19_Crisis_14.pdf. (Дата обращения: 20.05.2020).

10. Amofo E., Hanbali N., Patel A., Singh P. What are the Significant Factors Associated with Burnout in Doctors? *Occup. Med.* 2015;65:117–121.

11. Shanafelt T.D., Boone S., Tan L., Dyrbye L.N., Sotile W., Satele D., West C.P., Sloan J., Oreskovich M.R. Burnout and Satisfaction with Work-Life Balance among US Physicians Relative to the General US Population. *Arch. Intern. Med.* 2015;8:1377–1385.

12. World Medical Association Medical Ethics Manual. 2nd Edition: Available at: http://www.wma.net/en/30publications/30ethicsmanual/pdf/chap_6_en.pdf. (date of access: May 10, 2020).

13. Maheen Adamson. Psychological Stress Associated with the COVID-19 Crisis. Available at: https://www.nlm.nih.gov/dr2/Psychological_Stress_Associated_with_the_COVID19_Crisis_14.pdf. (date of access: May 20, 2020).

*Материал поступил в редакцию 06.12.21; статья принята после рецензирования 20.12.22; статья принята к публикации 21.03.22
The material was received 06.12.21; the article after peer review procedure 20.12.22; the Editorial Board accepted the article for publication 21.03.22*