



THE COVID-19 PANDEMIC: HIGHER MEDICAL EDUCATION CHALLENGES AND RESPONSES

© D.O. Ivanov, Yu.S. Aleksandrovich, V.I. Orel, E.V. Esaulenko, K.E. Novak, L.V. Ditkovskaya, V.V. Basina

St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia

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The coronavirus pandemic (COVID-19) has become a challenge to higher education worldwide, affecting roughly over 90% of the student community. Due to the pandemic issues, it was essential to adjust the educational process to changing circumstances. Efforts to curb the spread of the disease, including social distancing and self-isolation, have led to the need of initiating a new approach of education and developing effective communications in medical education with the organization of online education from 23.04.2020. The Saint Petersburg state pediatric medical University of the Ministry of health of Russia has adopted the Discord platform for distance learning. Training courses have been organized for physicians working in hospitals that have been sorted out to operate with patients with coronavirus infection using the Moodle platform with access to register and monitor trainees as well. Instructing teachers to work in these Internet scopes required fewest time, which allowed them to switch to distance learning in due time. In order to attest the timeliness and adequacy of the response of the higher medical education system in the context of the COVID-19 pandemic, in this article, the experience of the transfer of the Department of infectious diseases of adults and epidemiology to running educational activities in remote mode. The possibility of conducting online classes not only theoretical, but also practical in the specialties of infectious diseases and epidemiology with students, residents, postgraduates and physicians was demonstrated.

Keywords: coronavirus infection (COVID-19); educational process; higher medical education; e-learning.

ПАНДЕМИЯ КОРОНАВИРУСНОЙ ИНФЕКЦИИ: ВЫЗОВ ВЫСШЕМУ МЕДИЦИНСКОМУ ОБРАЗОВАНИЮ И РЕАГИРОВАНИЕ

© Д.О. Иванов, Ю.С. Александрович, В.И. Орел, Е.В. Эсауленко, К.Е. Новак, Л.В. Дитковская, В.В. Басина

Федеральное государственное бюджетное образовательное учреждение высшего образования «Санкт-Петербургский государственный педиатрический медицинский университет» Министерства здравоохранения Российской Федерации, Санкт-Петербург

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Пандемия коронавирусной инфекции (COVID-19) стала вызовом для высшего образования во всем мире, затронув более 90 % студенческого сообщества. Пандемия потребовала адаптации учебного процесса к изменяющимся условиям. Усилия по пресечению распространения заболевания, в том числе социальное дистанцирование и самоизоляция, привели к необходимости внедрения новой модели образования и разработке эффективных коммуникаций в медицинском образовании с организацией учебного процесса в режиме онлайн с 23.04.2020. В ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России для дистанционного обучения студентов используется платформа Discord. Организовано проведение циклов повышения квалификации для врачей, осуществляющих работу в стационарах, перепрофилированных на работу с больными коронавирусной инфекцией, в дистанционном режиме с использованием платформы Moodle с доступом для регистрации слушателей и их контроля. Обучение преподавателей работе в данных интернет-пространствах потребовало минимального времени, что

позволило перейти на дистанционное обучение своевременно. С целью демонстрации своевременности и адекватности реагирования системы высшего медицинского образования в условиях пандемии COVID-19, в статье представлен опыт использования дистанционного принципа для преподавания на кафедре инфекционных болезней взрослых и эпидемиологии. Продемонстрирована возможность проведения онлайн-занятий не только теоретических, но и практических по специальностям «инфекционные болезни» и «эпидемиология» со студентами, ординаторами, аспирантами и врачами.

Ключевые слова: коронавирусная инфекция (COVID-19); образовательный процесс; высшее медицинское образование; электронное обучение.

The new coronavirus infection began with the registration of the first cases of pneumonia of unknown etiology in local residents of Wuhan City, Hubei province of Central China. At the end of December of 2019, the Chinese authorities informed the World Health Organization (WHO) about a breakout of etiologically unknown pneumonia [23].

Chinese scientists have identified the causative agent, a new coronavirus [20], and determined the sequence of its genome. The new virus is at least 70% identical in genetic sequence to severe acute respiratory syndrome coronavirus (SARS-CoV) [17–19, 21], which causes SARS (atypical pneumonia), and was named SARS-CoV 2. On January 30, 2020, the WHO recognized the new coronavirus breakout as an international public health emergency. On February 11, 2020, the disease was named as coronavirus disease 2019 (COVID-19) [2].

On March 11, 2020, the General Director of the WHO reported that the spread of COVID-19 can be described as a pandemic [24]. The decision was based on the speed and scale of transmission of the new infection. When COVID-19 was announced as a pandemic, 118,000 patients were infected, of which 4291 died. Cases were reported in 114 countries.

In the Russian Federation, COVID-19, in accordance with Government Resolution No. 66¹ dated January 31, 2020, a new coronavirus infection (COVID-19, International Classification of Diseases [ICD]-10 code) has been added to the list of diseases that pose a danger to others [17], along with diseases approved earlier by Government Resolution No. 715² dated January 12, 2004.

¹ Decree of the Government of the Russian Federation dated January 31, 2020 No. 66 "About making changes to the list of diseases that pose a danger to others."

² Decree of the Government of the Russian Federation dated December 1, 2004 No. 715 "About the approval of the list of socially significant diseases and the list of diseases that pose a danger to others" (approved by the legislative Assembly of the Russian Federation, 2004, No. 49, article 4916).

On April 30, 2020, the third meeting of the emergency committee was held, convened by the General Director of the WHO in accordance with the international health regulations (IHR) (2005) in connection with the COVID-19 breakout [2]. The General Director presented an overview of the main results achieved in the area of COVID-19 control since the last meeting of the emergency committee on January 30, 2020. The Directors of the emergency departments of the regional bureau and the Executive Director of the WHO emergency program reviewed the situation in the regions and in the world. At the end of the ensuing discussion, the members of the committee agreed that the breakout remained a public health emergency of international concern (PHC) and made recommendations to the General Director of the WHO, who declared that the COVID-19 breakout continued to be a PHC [2].

The COVID-19 pandemic has become a challenge to countries and higher education, affecting more than 90% of the student community. Efforts to stop the spread of the disease, including social distancing and self-isolation, have led to widespread closures of primary and secondary schools, as well as colleges and universities, in at least in 61 countries [5]. These preventive measures led to the need to introduce a new model of education and develop effective communications in medical education with the organization of the educational process online from April 23, 2020 [22].

The United Nations on Educational, Scientific, and Cultural Organization (UNESCO) has established a global coalition on education and COVID-19 to support countries in implementing online learning systems to minimize disruptions in the educational process and maintain social contact with students. According to the General Director, the current situation challenges all countries to ensure uninterrupted education for all children

and young people in an equitable basis. Besides, she emphasized that in addition to the fulfillment of immediate needs, these efforts provide an opportunity to rethink the concept of education, expand opportunities for a distance learning, and make education systems more sustainable, open, and innovative. UNESCO is ready to support efforts to ensure continuity of learning and has published a list of available online learning applications and platforms that teachers and students can use [25].

The article analyzes the literature, including domestic and foreign sources on the topic “An online learning in higher education institutions,” as well as open data from the Unified Information System of the Ministry of Education and Science of the Russian Federation, the Ministry of Health of the Russian Federation, and Russian Agency for Health and Consumer Rights. The data of information messages published on the websites of the WHO, UNESCO, and health institutions that perform sanitary and epidemiological control in countries, information internet resources, and modern domestic and foreign publications, are studied and presented.

Educational websites must be used when the use of digital technologies is a necessary complement to a traditional higher education. The Discord platform is used for online educational activities for students of the Saint Petersburg State Pediatric Medical University of the Russian Federation. This platform is free with closed access, which can only be obtained by invitation of the teacher. This makes it possible to create a learning environment for conducting practical classes in real time, which can be attended by up to 50 students or doctors at a time. The presence of voice channels allows to conduct a survey of students, as well as group discussions of “cases” (virtual patient), which are essentially a review of patients with a diagnosis based on the identification of the main symptoms/syndromes of the disease, test results, and appointment of optimal therapy, considering the current health features of megalopolis residents [7]. The voice channels have a Go Live screen demonstration function: this allows teachers to deliver lectures and demonstrate the application of practical skills in simulated conditions [14], and students can communicate and

work together. All teachers were trained in a short period to use the platform for organizing practical classes and lectures.

The cycle “Particularly dangerous infections including the coronavirus infection” was developed for the training of doctors in the current situation. This cycle is implemented via remote mode using the Moodle platform with access for registration and monitoring of trainees.

According to the World Bank estimates, at the end of March 2020, almost 85% of the “learning” population in the world (more than 1.6 billion schoolchildren and students) did not attend schools and universities, and 161³ countries stopped full-time classes. In connection with the unfavorable situation due to COVID-19 in the Russian Federation, preventive measures were introduced, including the transfer of educational activities to online mode. From March 16, 2020, to protect the health of students, employees of educational and scientific organizations and universities were recommended to “organize training of students outside the location of universities including ensuring educational programs by them using remote technologies.”⁴ It should be noted that in the past years, attention has already been focused on the goals and objectives of the institute of electronic medical education: the development of a national platform for digital medical education. Many authors note that the movement in this direction is not a purely Russian decision and priority, an end in itself, but is aimed at improving its quality. In 2017, the order of the Ministry of Education and Science of the Russian Federation on the procedure for using online technologies in educational activities was issued⁵.

³ Order of the Ministry of education of Russia dated March 17, 2020, No. 103 “About the approval of a temporary order of support of realization of educational programs of primary general, basic general, secondary general education, educational programs of secondary vocational education and additional general education programs using e-learning and online educational technologies” (registered in the Ministry of Justice March 19, 2020, No. 57788).

⁴ Order of the Ministry of Education and Science of the Russian Federation dated August 23, 2017, No. 816 “About the approval of the procedure for the use of e-learning and online learning technologies by organizations engaged in educational activities in the implementation of educational programs.” (registered in the Ministry of Justice on September 18, 2017, No. 48226).

⁵ Decree of the President of the Russian Federation dated May 07, 2018, No. 204 “About national goals and strategic objectives for the development of the Russian Federation for the period up to 2024.”

Digital technologies in higher education are one of the main trends in the development of a society as a whole and are one of the national goals and strategic objectives of the Russian Federation up to 2024 [9]. Among the main trends and prospects for the development of a higher education in the Russian Federation, we can highlight the use of multimedia technologies and visualization systems in the educational process, the widespread introduction of online and e-learning technologies, and as a result, the increasing popularity of online education. Of course, the question arises: how to change education so that it becomes not just one of the areas of social obligations of the state, but the engine of a social and economic development of the country? The answer is digitalization of education that allows us to largely straighten the conditions for obtaining it at all levels. Therefore, the development of accessible online resources and platforms, as well as online learning, should become the norm in the Russian education system⁶.

In connection with preventive measures related to the threat of COVID-19 spread, considering regulatory documents received at the federal and regional levels, the Saint Petersburg State Pediatric Medical University received an order to transfer students from all faculties and training levels, regardless of the course, to online learning from March 23, 2020⁷. Based on the Decree of the President of the Russian Federation⁸, the subsequent order of the rector⁹ approved the provision of teachers of departments to implement educational programs using online educational technologies during practical classes, lectures and interaction with deans, subject to the conditions of complete self-isolation of employees. In accordance with the methodological recommendations of the Ministry of Science and Higher Education of the Russian Federation [10], developed based on the federal law

“About the education in the Russian Federation,”¹⁰ the university has fully switched to using online courses from March 23, 2020, which will be provided for an indefinite period.” Currently, we can say with certainty – at least until the end of the semester.

The use of non-limiting active methods [1, 8] in teaching, which is conducted online – a problematic lecture by a teacher and independent work of students with literature – is easily feasible. Lectures for at least the last decade have been accompanied by a multimedia demonstration, which is easily immersed in the online environment and shown to students. By the time of transition to online learning, the Department of Infectious Diseases of Adults and Epidemiology in accordance with the curriculum and schedule performed lectures in full. Traditionally, the series of lectures on specialty, bachelor's, master's, and higher-qualification training programs includes material on particularly dangerous infectious diseases, emergent infections, and geo-epidemiological situation in the country and globally [11–13]. Due to the current pandemic, coronavirus infection (etiology, clinical and epidemiological characteristics, methods of diagnosis, therapy, and prevention) was included in practical (seminar) classes in the disciplines epidemiology and infectious diseases for students of Medicine, Pediatrics, Preventive Medicine, Medical Biophysics, and Dentistry, as well as residents and postgraduates, regardless of their specialty [6].

For a higher medical education, including the discipline infectious diseases, students must be trained in practical skills for the examination of the patient and its management (work of the student at the bedside), which is impossible in terms of contacting students and teachers exclusively in an electronic information and educational environment. However, in the online learning environment, the teacher can demonstrate the application of practical skills in simulated conditions using phantoms [14]. The teacher creates a problem situation in the form of a clinical case.” This training method is an active non-game simulation and has a multifunctional

⁶ Order of the rector of the Saint Petersburg State Pediatric Medical University No. 160-0 of March 20, 2020.

⁷ Order of the rector of the Saint Petersburg State Pediatric Medical University No. 160-0 of March 20, 2020.

⁸ Decree of the President of the Russian Federation No. 239 “About measures to ensure the sanitary and epidemiological well-being of the population on the territory of the Russian Federation in connection with the spread of a new coronavirus infection (COVID-19)” dated April 2, 2020.

⁹ Order of the rector of the Saint Petersburg State Pediatric Medical University No. 194-0 dated April 3, 2020.

¹⁰ Federal law No. 403-FZ “About amendments to the Federal law ‘About the education in the Russian Federation’ and certain legislative acts of the Russian Federation” dated December 2, 2019.

value in the educational process [1, 8]. The analysis of a specific situation can be used to solve three didactic tasks: consolidating new knowledge (obtained during the lecture), improving already acquired professional skills, and activating the exchange of knowledge and experience. Practical training promotes activation of cognitive activity of students, uses their knowledge in professional activities on infectious diseases—practical skills in differential diagnosis, purpose, and interpretation of results of laboratory and instrumental research, choice of therapeutic strategy, and planning of quarantine measures at the source of infection, and preventive measures. It is necessary to train the compliance of the provided medical care with modern ideas about its necessary level and volume, considering the patient's characteristics and capabilities of a particular institution [3]. In addition, this option of teacher–student contact allows monitoring of the learning process with assessment of the student's knowledge and readiness for the lesson. To monitor the learning process, prepared questions on the topic and assessment tests should be used. The above assessment tools of students' knowledge were used earlier in practical classes on the discipline infectious diseases at our department, as well as by departments of other medical universities [1, 4, 15, 16].

The Discord platform for online learning, which was chosen at the suggestion of students at the Saint Petersburg State Pediatric Medical University, is available and complies with the principle of justice and equality. Training teachers to work in this internet space required a minimum time (6 h), making it possible to switch to online learning in a timely manner.

To implement measures aimed at preventing COVID-19 spread, the university continued to conduct training cycles for doctors who have been re-trained to work with patients with coronavirus infection online. Training takes place online in accordance with the developed cycle “Especially dangerous infections, including coronavirus infection” lasting 36 h, which is reviewed, approved, and included in the list of cycles posted on the portal of continuing medical education. The cycle includes the main provisions of clinical and epidemiological,

laboratory, and radiological diagnostics for COVID-19, treatment of patients (children and adults), depending on the severity, and preventive measures. Teaching is conducted by the staff of the departments of infectious diseases of adults and epidemiology, infectious diseases for children named after Professor M. G. Department of a post-graduate and additional professional education (PG and APE), clinical laboratory diagnostics of PG and APE, and radiology and biomedical imaging of PG and APE. Training of students is being successfully implemented at the present time.

Thus, teaching infectious pathology is inseparable from the global epidemiological situation and preventive work aimed at preventing importation and infectious disease spread in the country. The appearance of new nosological forms in the etiological structure of infectious diseases caused by emergent pathogens leads not only to epidemics, but also to pandemics. The impact of COVID-19 worldwide and its consequences are increasingly referred to as “coronacrisis.” The pandemic affected not only the economy and politics, but also the education system, which led to the mass closure of schools and universities or the transfer of students to distance education. In the Russian Federation, in 2018, a trend in the development of educational programs was formed, which was the search for the optimal ratio of offline and online education. From 2018 to 2020, preparatory work was conducted in the Saint Petersburg State Pediatric Medical University, which showed that these forms of training do not oppose each other, but require a coordinated configuration, considering the capabilities of the university, teachers, and students at all levels (students and doctors). The experience of using the online principle for teaching at the Department of Infectious Diseases of Adults and Epidemiology during the COVID-19 pandemic has already shown the possibility of conducting not only theoretical, but also practical classes on the specialties infectious diseases and epidemiology with students, residents, postgraduates, and doctors. It should be noted that the main reason that helped the university team to fit into the new reality is the ability to act in conditions of uncertainty and take responsibility.

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◆ Information about the authors

Dmitry O. Ivanov – MD, PhD, Dr Med Sci, Professor, Rector. St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: doivanov@yandex.ru.

Yury S. Alexandrovich – MD, PhD, Dr Med Sci, Prof., Head, Department of Anaesthesiology, Resuscitation and Emergency Paediatrics of the FP and AdE. St. Petersburg State Pediatric Medical University of the Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: jalex1963@mail.com.

◆ Информация об авторах

Дмитрий Олегович Иванов – д-р мед. наук, профессор, ректор, заслуженный врач РФ, главный внештатный специалист-неонатолог Минздрава России. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: doivanov@yandex.ru.

Юрий Станиславович Александрович – д-р мед. наук, профессор, заведующий кафедрой анестезиологии, реаниматологии и неотложной педиатрии ФП и ДПО. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: jalex1963@mail.com.

◆ Information about the authors

Vasily I. Orel — MD, PhD, Dr Med Sci Professor, Head. Department of Social Pediatrics and Public Health Organization and AF and DPO. St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: viorel56@list.ru.

Elena V. Esaulenko — Dr Med Sci, Professor, Head of the Department of Infectious Diseases in Adults and Epidemiology. St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: eve-gpmu@mail.ru.

Kseniya E. Novak — MD, PhD, Associate Professor, Department of Infectious Diseases in Adults and Epidemiology. St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: kseniya.novak@mail.ru.

Liliya V. Ditkovskaya — MD, PhD, Associate Professor, Department of Pediatrics, Endocrinology and Abilitology, Faculty of Postgraduate Education. St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: liliya-ditkovskaya@yandex.ru.

Valentina V. Basina — Assistant Professor, Department of Infectious Diseases in Adults and Epidemiology. St. Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russia. E-mail: v.basina@mail.ru.

◆ Информация об авторах

Василий Иванович Орел — д-р мед. наук, профессор, проректор по учебной работе, заведующий кафедрой социальной педиатрии и организации здравоохранения ФП и ДПО. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: viorel56@list.ru.

Елена Владимировна Эсауленко — д-р мед. наук, профессор, заведующая кафедрой инфекционных болезней взрослых и эпидемиологии. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: eve-gpmu@mail.ru.

Ксения Егоровна Новак — канд. мед. наук, доцент кафедры инфекционных болезней взрослых и эпидемиологии. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: kseniya.novak@mail.ru.

Лилия Викторовна Дитковская — канд. мед. наук, доцент кафедры педиатрии, эндокринологии и абилитологии ФП и ДПО, декан ФП и ДПО. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: liliya-ditkovskaya@yandex.ru.

Валентина Владимировна Басина — ассистент кафедры инфекционных болезней взрослых и эпидемиологии. ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Санкт-Петербург. E-mail: v.basina@mail.ru.