

# The Role of Medical Education Digitalization in Transformation of Medical Assistance Paradigm of the 21st Century

Naboychenko E.S.\* Vershinina T.V. Noskova M.V.

*Ural State Medical University, Yekaterinburg, Russian Federation*

*\*Corresponding author. Email: dhona@mail.ru*

## ABSTRACT

The article discusses the medical education modernization based on digitalization as a condition for the health care sustainability. One of the strategic tasks of the practical health care system is to provide people with high-quality medical assistance, to preserve and promote people's health, as well as to increase their life expectancy. Digital transformation in practical health care is predetermined by scientific and technical progress, global informatization, mobility, patient-centrality. In light of this, medical education is aimed at training highly qualified practitioners of health care with a high level of personal and professional culture, forming a specialist who is professionally ready to practice medicine independently in conditions of a modern level of material and technical equipment of health care, focused on the social responsibility of the doctor and patient. There are results of research, the goal of which is to study opinions of future health care practitioners on the medical education digitalization with a view to further planning of training programs development. The FSBEI HE Ural State Medical University of the Ministry of Health of Russia acted as an empirical base. The total sample was 584 students of 1-4 courses of Pediatrics, General Medicine. The tasks facing universities, actualize the choice of strategies and global trends for further development in the digital direction, which will strengthen and focus their attention on improving the quality of future doctors training.

**Keywords:** *medical education, digital health, medical assistance, digital educational technology*

## 1. INTRODUCTION

Today, issues on reforming the health care system and higher medical education are actively discussed at the state level. One of the strategic tasks of the practical health care system is to provide the people with high-quality medical assistance, to preserve and promote people's health, as well as to increase their life expectancy. Digital transformation in practical health care is predetermined by scientific and technical progress, global informatization, mobility, patient-centrality, Russia's entry into the global “digital health” trend.

For this reason, the requirements for practical training of future doctors, for professional skills improvement, for development of professionally important qualities predetermined by the training and education level are changing. Modern higher medical school is focused on training highly qualified practitioners of health care with a high level of personal and professional culture, forming a specialist who is professionally ready to practice medicine independently in conditions of a modern level of material and technical equipment of health care, focused on the social responsibility of the doctor and patient. [1]. Special attention is currently being paid to the information and digital culture of a specialist as an integral part of the general professional level of a doctor.

“Features of medical assistance provided using telemedical technologies” and requirements for the quality of doctors training are described in the laws of the Russian Federation “On the Basics of Protecting the Health of Citizens in the Russian Federation” (No. 323-ФЗ dated November 21, 2011) and “On Education in the Russian Federation” (No. 273-ФЗ dated December 29, 2012). Thus, the Federal Law of the Russian Federation “On the Basics of Protecting the Health of Citizens in the Russian Federation” (No. 323-ФЗ dated November 21, 2011) and the Federal Law of the Russian Federation “On Amending Certain Legislative Acts of the Russian Federation on the Use of Information Technologies in the Field of Health Protection” (No. 242-ФЗ dated July 29, 2017) indicate the possibility of a doctor to provide medical assistance using telemedical technologies, for example, “the attending doctor may correct the previously prescribed treatment provided that he is diagnosed and prescribed treatment in person (examination, consultation)” (No. 323-ФЗ, Art. 36.1) during consultations using telemedical technologies. It should be emphasized that today the use of digitalization in medicine is impossible without the digital technologies inclusion in medical education – at the stage of training a specialist who meets the requirements not only of the Federal State Educational Standard, but also of a constantly updated professional environment. The integrated inclusion of digitalization in educational process of a modern medical university is a distinctive factor in the

development of a modern medical community, striving for competitiveness and medical development.

The relevance of this research is due to a change in the requirements for conditions and quality of doctors training at the modern stage, which is confirmed by the 2020 Concept of Electronic Education, according to which both students and practitioners are required to systematically undergo professional training in e-education [2].

Information and communication technologies, unfortunately, do not form a holistic view among students about the content of training, as well as “medical education digitization is a danger that the practical side of the medicine studying will move outside the hospital wards” into virtual reality [3]. Other disadvantages of digital education include the fact that automated systems cannot replace live training.

At the same time, the task of such education is not the transfer of publicly available information, but the formation of metacognitive competencies related to the development of professional thinking. In this regard, it seems that in the near future, blended learning, which combines e-learning and interaction with real teachers, can be a team activity that causes the sense of belonging of students, involvement in the educational process, which forms a sense of responsibility for their professional development [4].

The higher medical school has a high innovative potential that will allow to implement modernization transformations of the higher education system and determine specific ways to change it, since traditional higher education is under threat [5]. Comprehensive preparation of university and teachers to work in a different technological format, using information and communication technologies and electronic learning modalities is required to implement digital technologies at a high level and to use the e-learning modalities [6, 7].

Social changes lead to modification of the requirements for higher education and its results (both in Russia and abroad) [8, 9], which is an effective channel of image communication of a modern university with its audiences, which is especially relevant in our time of “virtual competition” of universities [10], makes it possible to “train the next generation of clinicians and medical scientists to solve data problems that may have a direct impact on patient treatment in the coming decades” [11].

We presented these issues at the III International Conference “Social and Cultural Transformations in the Context of Modern Globalism” in Grozny on the basis of Kh. I. Ibragimov Complex Research Institute RAS and obtained a positive assessment. The resolution to expand the sample of participants was adopted.

## **2. METHODOLOGY OF THE STUDY**

The goal of research is to study the opinions of future doctors on medical education digitalization.

The research was conducted in two stages. Results of the first stage, discussed at the conference in Grozny, provided the basis for the second stage, the goal of which was to

determine the opinions of a wider number of respondents about the digital technologies introduction in higher medical education and to identify factors that impact on the change in the respondents' attitude to new educational technologies, based on IT technology. The research used methods of theoretical and methodological analysis of psychological and pedagogical literature on the stated problems, questionnaires, content analysis, mathematical statistics. The FSBEI HE Ural State Medical University of the Ministry of Health of Russia acted as an empirical base. The total sample was 584 students of 1-4 courses of Pediatrics, General Medicine, of which 220 respondents participated in the first stage, 364 - in the second stage. The first stage showed that gender characteristics are immaterial in assessing the importance of integrating digital technologies in higher medical education; therefore, at this stage, the gender composition of the respondents is not given. To achieve this goal, we used a questionnaire developed at the first stage and including 15 questions that describe general information.

## **3. DISCUSSION OF RESULTS**

As in the first stage, the study of the associative series for the concept of “digital technologies in a medical university” using the content analysis method revealed that the most common are concepts such as online courses, video lectures and presentations, including video lessons, electronic library, educational platforms of the university, electronic, interactive atlases, 3D models, online testing in academic disciplines.

There were respondents who took part in the second stage, of which: the majority of students (95.3%) consider that digital technologies in education include electronic textbooks; in addition, a significant proportion of students (84.1%) associate digital technology with the format of online courses; more than half of the respondent (59.1%) students disclose the concept proposed in the research as online discussion clubs in academic disciplines, approximately the same number of participants (57.9%) correlate technical means, mainly tablets, with the proposed concept; connect digital technologies with educational blogs and simulators (32.1%).

According to respondents, digital learning will not be able to replace “live” communication (86.3% gave such an answer to the question “Can digital education be replaced by “live” communication?”). This answer is motivated by the fact that respondents consider personal contact with the teacher to be important; As an explanation, the following options were proposed: “through live communication, you can acquire practical skills,” “discuss new or learned information”, “ask questions to better remember educational information”, “feel true emotions”, since the computer is not only a translator of information, but also does not allow transferring the emotional-sensual component that is important in the “man-man” profession, which ensures the formation of communication skills in terms of choosing and constructing communication strategies and tactics. Some students pointed out that each

of them has its own way of mastering and presenting educational information, and this, in turn, has an impact on their educational achievements. As in the first stage, respondents emphasized that for social skills formation there is a need to communicate not only with other students, but also teachers; from their point of view, digital educational technologies adversely affect the adaptive processes of students at the university and can even lead to personality degradation, as a result of which a decrease in the speaking skills of young people (oral and written) is not excluded and, as a result, a low level of communicative culture. As in the first stage, a small group of respondents found it difficult to answer the question. Also, only a small group of students participating in the research (9.6%) believe that digital learning can replace “live” communication.

The results of research raise issues about the emerging contradiction, which is expressed in the fact that, on the one hand, despite the digitalization of the modern generation of young people, they still prefer to perceive educational information in a traditional form (in an audience at a lecture or practical lesson with teacher) and using traditional means - paper textbooks, atlases, etc. Respondents highlight the positive aspects of traditional forms and means such as the ability to hold the book in your hands, flip through it, emphasize important material or keywords. However, there are those students who prefer the electronic version of the educational literature (31.4%). On the other hand, the majority of respondents say that they spend an average of 6 hours a day on gadgets (computer, tablet, phone), including during the training activity - from 1.5 to 3 hours a day.

It should be noted that there has been a clear tendency for the transition in monitoring the result of mastering the content of academic disciplines to computerized testing. For now, each university has an educational portal on which electronic educational and methodological complexes for students (textbooks, teaching aids, 3D atlases, lecture presentations, etc.) are displayed in the required and sufficient volume for each discipline. One would think that such provision should facilitate the disciplines mastery and contribute to improving the quality of the educational process. Despite this, 51.3% of students say that e-education does not always provide quality learning. As an explanation, they mention such reasons as “eyes are tired”, “not all topics of educational information can be fully and qualitatively based on IT technologies”, “working at the computer involves the temptation to be distracted by other Internet sites”, “information in the proposed form not always is understandable for perception”. It is also noted as a drawback that e-education does not control the level of knowledge acquisition and the formation of competencies. We consider to pay attention to the level of motivational sphere development of the personality, the student’s desire. At the same time, 15.3% of students mentioned the positive side of e-education,

noting such factors as positive: a variety of blogs and YouTube channels that are taught by university professors, which expands the student’s ability to choose options for information presentation by teachers of other universities and time for classes (at home, in transport, etc.), free time planning.

It is also interesting that preponderance of students prefer traditional lectures, but at the same time they also assess distance lectures and webinars positively. At the same time, respondents also speak positively about e-learning as a way of generating digital literacy, independence, and the ability to quickly find the necessary information; research participants emphasize that the use of IT technologies in the educational process affects the enhancement in analyzing fairly large information arrays, sort them, and filter.

Summarizing the results of research, we can say that both stages of research showed the need for a reasonable digital transformation of education, combining traditional and innovative approaches to the educational process organization, since this process not only ensures the introduction of IT technologies, but also is a significant cultural and organizational change in medical education.

#### **4. CONCLUSION**

Digitalization of a medical university is a priority, both in education and in practical health care. It is able to provide access to educational portals; gives new opportunities in the generation of knowledge and competencies in access expanded in time and space due to the potential of educational resources, the use of which is available at any time and from any geographical point. Digitalization in medical education is a trend direction and is regarded as a condition for health care sustainability . “Adequate digitalization of health care will make it possible to change the paradigm of medical assistance, as well as the mechanism of patient participation and involvement. Health care sustainability will depend on how efficiently will we design digital services ”[12].

Digital technologies in medical education allow students to engage in a continuous process, i.e. realize the principle of lifelong learning that is relevant today and get a personalized approach to learning. Hybrid learning based on the competent and effective use of digital technology, followed by a discussion of complex and practical issues in the classroom, will allow students to become highly qualified, versatile, developed health care practitioners. Improving the quality of training for future doctors capable to join the global trend of digital health requires the choice of strategies and global trends for further development in the digital direction, which are based on a good choice of IT technologies and their rational use in the educational process.

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