ASPECTS OF TEACHING STUDENTS TELEMEDICINE SKILLS IN MEDICAL UNIVERSITIES

Bobir T. Khalmukhamedov [1], Nargiza M. Nurillaeva [2]

1 PhD student, Assistant of the Department of Internal Deseases №1
of the Tashkent Medical Academy, Tashkent, Uzbekistan
E-mail: bobur.h@mail.ru

2 Doctor of Medical Sciences, Associate Professor, Head of the Department of Internal
deseases №1 of the Tashkent Medical Academy, Tashkent, Uzbekistan
E-mail: nargizanur@yandex.ru

ABSTRACT

Objective of the study: to study and analyze the experience of telemedicine technologies by some foreign countries into the field of education of medical students. **Material and methods:** analysis and generalization of scientific, methodological and foreign literature information about telemedicine technologies and educational aspects of electronic health skills of medical students. **Results:** The use of distance learning technologies in training in medical specialties is very relevant and very popular. On the basis of distance learning technologies, students have the opportunity, in addition to studying theoretical material, to gain experience working with real technical means. Students can not only see the system through the eyes of a student, but also work as a developer and teacher. In this sense, distance education technologies are one of the components of a new direction based on the use of telecommunications for targeted exchange of medical information between specialists - telemedicine. Today at Uzbekistan Various methods of organizing distance learning for medical professionals based on new information technologies are used. Recently, three types of distance learning based on the following methods have become increasingly common: video conferencing (VCS) technologies; computer telecommunication technologies. **Conclusion:** The introduction of the course "Electronic polyclinic" in the process of training undergraduates of the 6th year of the Faculty of Medicine will increase and strengthen students' readiness for medical work in primary health care. As students become more confident and prepared for their work, their motivation for studying and professional activities will also increase. Therefore, it is very important to develop and improve training courses on working with electronic resources, especially in medical institutes of our republic.

Key words: osteoarthritis, joint, radiological images, X-ray.

INTRODUCTION

With the rapid development of science and technology, people's needs are also increasing. Yesterday's inventions, which seemed like a miracle, have now become commonplace and are a means of making everyday life easier. At the same time, the role of modern information and communication technologies is important. The main priority is the ongoing transformations in the medical sphere aimed at improving the standard of living of the population, strengthening their health and ensuring a high life expectancy.

One of the urgent issues awaiting its solution in the field of medicine is the introduction of the Institute of telemedicine, which is widely used in developed countries, especially the development of the draft law of the Republic of Uzbekistan "On Telemedicine", which is its legal basis, as well as the widespread introduction of the "electronic polyclinic" system in providing comfortable conditions for the population,

Actual information about medical and pharmaceutical workers, the fact that a single database of reliable medical statistics is not fully formed, does not allow us to adequately assess the state of the health care system and develop effective measures to solve existing problems [6].

Telemedicine is a tool that allows doctors and patients to gain remote access to modern medical resources and services, including international ones. Interest in telemedicine technologies has been noted in our country for more than a decade. After numerous publications in the press, there has been a long lull, which has only recently been replaced by some activity.

Telemedicine systems and complexes are developing very intensively all over the world, and in many countries public and government organizations have been established to coordinate the development of telemedicine. In Canada, a Telemedicine Society has been established to coordinate the development of the telemedicine program, bringing together medical professionals, teachers, and IT companies. The Telemedicine Association is active in the United States. To coordinate telemedicine activities in Japan, a directorate has been established under the Ministry of Health. The situation is similar in Western Europe. China, with the active participation of the telecom operator ChinaSatCom, is planning to create a satellite network in Southeast Asia to provide telemedicine services. In the next few years, the Indian Space Research Authority is going to launch a special telecommunications satellite, Healthsat, into orbit, which will be used exclusively for the benefit of telemedicine.

All these processes are initiated not only by the development of new technologies, including in medicine, but also by the recent large-scale epidemics,

such as SARS or avian flu, which threaten the death of many people and therefore require a rapid response, including in areas where there are no medical centers and it is difficult to provide high-quality services. medical services.

Today, telemedicine technologies are used for:

* remote diagnostics and counseling, emergency expert assistance in difficult medical cases;

* disaster medicine, for getting quick access to qualified medical care in hard-to-reach places or places with destroyed infrastructure;

* follow-up and consultation of patients after complex surgical procedures;

* and, of course, for distance medical education.

The introduction of the latest technologies, drugs and medical equipment, the need to maintain the relevance of special knowledge make the problem of distance continuous training and retraining of medical personnel in the field extremely relevant. This also includes the need to ensure fast and constant access of medical professionals to the latest medical information and the possibility of direct contact with high-level specialists.

In accordance with the order of the Ministry of Health on commissioning of the automated information system (AIS) of the unified electronic registration and appointment to a doctor via the Internet "Electronic Polyclinic" dated August 17, 2017, centralized databases were created in many family polyclinics in Tashkent, and a system of electronic outpatient cards and medical records was established. Via the official website of the Ministry of Health (reg. minzdrav.uz and ssv.uz) citizens can make an appointment with a doctor, get information about the doctor and the institution. Patients can evaluate the quality of medical services received [4].

Today by According to the Ministry of Health of the Republic of Uzbekistan, 423 institutions are connected to the Electronic Polyclinic information system, including: 167 family polyclinics, 168 multi-specialty polyclinics, 19 regional (children's) multi-specialty medical centers, 69 regional PDMS and branches of centers. The number of collected patient data reached 8,412,211 people. The Electronic Polyclinic information system allows medical professionals to increase the efficiency of work and transparency of information. As of February 15, 2021, the number of users of the system exceeded 10,000 people. The number of indicators listed above increases over the years. However, improving the eHealth system faces a number of challenges today. In particular, some medical institutions do not have complete computer equipment, high-quality Internet access, doctors do not have enough skills to use the system, etc. Necessary measures are being taken

to eliminate these shortcomings and problems, and in the near future the system will be available as a mobile application [5]**.**

Given the above, for the effective operation of e-health, it is necessary to radically improve the level of training of medical personnel. An urgent task in the process of modernizing the modern educational process in a medical university is to introduce a system of active teaching methods based on Hi-Tech technologies into the educational process.

OBJECTIVE OF THE STUDY

To study and analyze the experience of telemedicine technologies by some foreign countries into the field of education of medical students.

MATERIAL AND METHODS

Analysis and generalization of scientific, methodological and foreign literature information about telemedicine technologies and educational aspects of electronic health skills of medical students. In accordance with the Decree of the President of the Republic of Uzbekistan No. PP-3071 dated June 20, 2017 "On measures for further development of specialized medical care for the population of the Republic of Uzbekistan in 2017-2021", the Electronic Polyclinic system was launched. "Electronic polyclinic" is one of the most important projects developed and implemented by the Center for the Development of Information and Communication Technologies. Using this system, the population can make an appointment with a doctor at a convenient time, without leaving home, get information about the institution and doctors in their area, and also assess the quality of medical services received. The advantages of this system for polyclinics are automated data registration, the ability to maintain a single electronic outpatient medical record in family polyclinics. This system also has a number of features: formation of information about the location of medical institutions and their working hours; introduction of the electronic service "Make an appointment with a doctor"; formation of the work schedule of doctors.

RESULTS.

Distance learning in the framework of telemedicine today includes:

* training of medical students and medical staff, advanced training of doctors;

* work with extramural postgraduates and doctoral students;

* seminars for rapid exchange of information on new diagnostic and treatment methods, currently available only to specialized health care institutions;

* remote broadcast of operations;

* training users in mastering new medical technologies, equipment, etc.;

* access to the services of centralized and international medical centers and training centers.

Today at Uzbekistan Various methods of organizing distance learning for medical professionals based on new information technologies are used. Recently, three types of distance learning based on the following methods have become increasingly common:

* Video conferencing (VCS)technologies;

* computer telecommunication technologies;

* a combination of the first and second.

Videoconferencing-based training is currently the most attractive, providing direct visual contact with a remote audience. This is especially true for the system of advanced training of medical personnel, since trainees can become not just bystanders, but also active participants in the use of new medical technologies (operations, examination methods), discussions, etc.This form of distance learning is interactive in its essence and, of course, can be considered very promising. A great advantage of this form of training is the ability to simultaneously connect various types of medical equipment to the VCS equipment and broadcast it on video, simultaneously with the patient's image, medical parameters (graphic information, radiographs, and much more).

In addition, it is precisely this technology of tele-training that makes it possible to most effectively use the opportunity to include international medical centers and Western specialists with knowledge and technologies that are still difficult to access in Uzbekistan in the process of training or advanced training.

The modern telemedicine solution is a complex complex, and includes:

* technical means of access to telecommunication networks,

* communication channels and network means of access to them,

* video conferencing equipment,

* digital medical equipment, sensors and other converters of medical information into data for transmission over communication channels,

* medical information, expert diagnostic systems and databases,

* distance learning systems.

The standard set of equipment for medical video conferencing usually includes:

* IP channel,

* Computer,

* Videoconferencing equipment,

* Equipment and programs for input, processing and storage of images, ECG curves, etc. (scanner, video input card to the computer, image processing and storage program; program for maintaining a database with patient records),

* Video Recorder,

* An audio communication system.

Currently, for the creation of telemedicine training centers, videoconferencing equipment of various manufacturers can be used.

Solutions for distance learning can be based on different systems (codecs) depending on the purpose (volume of premises, number of listeners, number of simultaneously connected remote points, etc.). At the same time, depending on the need, such a solution can be supplied with additional equipment, which, as usually not included in the standard delivery. This is, for example, a control panel with a touch screen (touch screen), i.e. a device that allows you to easily control the entire distance learning system by pressing the buttons of the graphical interface directly on the panel screen. The list of managed devices includes cameras, recording devices of any type, documentary cameras, and microphones. Among such equipment is a special microphone placed on the ceiling and allowing you to include everyone present in the room in the conversation. This includes the Locator Mat, a special mat that the teacher steps on and automatically redirects the cameras to a previously programmed location, such as a podium or whiteboard. These are also video-electronic whiteboards (Whiteboards), which allow you to broadcast what is written directly to computers and the videoconferencing system connected to them [8].

Uzbekistan plans to create a Unified medical information Center and introduce a "Smart Medicine" system. The document is designed to implement the tasks defined by the Presidential Decree of 22.01.2018 no. <u>UP-5308</u> "On the State Program for the implementation of the strategy of actions on five priority areas of development of the Republic of Uzbekistan in 2017-2021 in the "Year of Support for Active Entrepreneurship, Innovative Ideas and Technologies".

As part of the project, it is planned to create an integrated infrastructure of the Unified Telemedicine Network (UTS), covering all medical institutions in the country. The Unified Medical Information Center will have to ensure its functioning, as well as introduce "Smart Medicine"technologies.

These innovations will allow us to move to a qualitatively new level of service delivery, to ensure an improvement in the quality of diagnostic and therapeutic care for the population.

The main directions of development and application of telemedicine technologies in Uzbekistan are defined:

- telemedicine consultation/telementoring. In this case, the patient is discussed by the attending physician with a consultant located in another medical institution, including another city;

- telemedicine lecture/seminar. The lecturer (teacher) can address all participants at the same time, and they, in turn – - to the lecturer, if it is not possible to communicate with each other personally;
- telemonitoring (telemetry). The data of many patients is transmitted to the consultation center. This technology requires the patient to wear a special device that provides objective data about the patient.

The obtained data are necessary for specifying the diagnosis and prescribing the most effective treatment; telemedicine meeting/ consultation/ symposium. Communication is organized according to a scheme that allows meeting participants located in different institutions to communicate with each other and discuss current issues [7].

Now, for the convenience of patients and doctors, all documents are translated into electronic form. The ability to make an appointment with doctors not only at the reception, but also through special terminals in polyclinics and on the Internet, of course, significantly saves the patient time and effort. Information and communication technologies in the e-medicine system should ensure timely and reliable exchange of information necessary for the provision of e-medicine services.

Introduction of electronic healthcare in the Republic of Uzbekistan is characterized by the reorientation of modern medical education in higher education institutions to a personal and competence-based approach. It is a priority and provides for the modernization of the education system through the introduction of training elements based on the formation of basic competencies that allow graduates to independently acquire knowledge that is as close as possible to practical healthcare.

From this point of view, a great emphasis is placed on practical training of specialists in the field of e-health, since students who have completed a bachelor's degree, i.e. future family doctors who have received a diploma, immediately begin practical work in the primary health care sector. Today, taking into account the development and implementation of e-health, medical students and the teaching staff of medical universities are concerned about the specifics of student training in graduate departments. In this regard, medical universities should actively develop and conduct training sessions to facilitate students ' adaptation to the new rules of the organization of the health care system. [3]

The use of electronic documents in the practice of medical personnel, in particular a doctor, especially in primary health care, is important in improving the quality of medical care provided to the population. Introduction of electronic outpatient medical records and medical histories in a test mode is currently used in several polyclinics and hospitals of the Republic of Uzbekistan.

Due to the use of a variety of updated reference books and templates, entering data on cases of medical care provided to a patient in an electronic medical record takes much less time than when manually filling out outpatient cards and medical records. In addition, its implementation eliminates the problem of transporting documents from one medical organization to another, increases the degree of protection of personal data of patients-this ensures a high-quality exchange of information necessary for the provision of e-medicine services. [1].

Currently, students studying at the clinical bases of medical institutes are trained in the rules of maintaining medical documentation in paper form. We are faced with the task of full-scale implementation of electronic resources in the training process of students of graduating courses, which will allow you to quickly find existing and add new information about all cases of medical care provided to the patient, as well as automatically generate medical documents.

Based on modern telemedicine innovative computer technologies, teach students of the 6th year of the Faculty of Medicine the following skills: opening an electronic outpatient card and entering patient passport data; entering complaints and anamnesis, results of an objective examination, making a diagnosis; assigning laboratory and instrumental examinations for the patient in the patient's electronic card; prescribing treatment for this patient. To increase professional and educational motivation, early readiness of students for practical activities in primary care.

Conclusions. The introduction of the course "Electronic polyclinic" in the process of training undergraduates of the 6th year of the Faculty of Medicine will increase and strengthen students ' readiness for medical work in primary health care. As students become more confident and prepared for their work, their motivation for studying and professional activities will also increase. Therefore, it is very important to develop and improve training courses on working with electronic resources, especially in medical institutes of our republic.

Thus, more active State involvement in these regulatory and organizational processes is required. A separate issue is the problem of creating regional and national medical information systems and databases, combining them with telemedicine networks.

But knowing about the difficulties of training medical personnel and the need for additional postgraduate education, we can say with confidence that distance education in medicine is extremely necessary today, and that is why it has now become in demand. The use of modern means of communication and computer technology leads to a fundamentally new organization of the learning process, bringing it closer, on the one hand, to individual types of training, and on the other,

allowing you to perform part of the training at the student's place of work. At the same time, according to experts, the material costs of medical institutions associated with training specialists in such a system are reduced by about 10 times.

REFERENCES.

1. Agranovich N.V. Forms and methods of teaching students at the Department of polyclinic therapy: met. rec. Stavropol: StGMA Publishing House, 2011.

2. Agranovich N.V., Khodjayan A. B. Opportunities and effectiveness of distance learning in medicine. 2012. No. 3. pp. 545-547.

3. Gulyaeva S.F., Gulyaev P.V. National project "Health" and optimization of quality and strategy of training interns at the Department of polyclinic therapy.

4. http://med.uz/news/medical-news-uzbekistan/elektronnaya-poliklinika-sovremennyy-metod-zashity-zdorovya-naseleniya/

5. https://ssv.uz/ru/news/elektronnaja-poliklinik

6. https://zamin.uz/uzbekiston/54283-uzbekistan-elektron-poliklinik

7. https://www.norma.uz/proekts_npa/quality of medical care

8. https://studbooks.net/2250088/informatika/telemedicine