



APPLICATION OF INFORMATION TECHNOLOGIES IN MEDICINE: ELECTRONIC HEALTH SYSTEMS

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Abstract

This article broadly covers modern trends in the use of information technologies in the medical field, in particular, the importance of electronic health systems (e-Health). Electronic health systems effectively organize information exchange between doctors, patients and healthcare institutions, improve the quality of services and expand their use. The study separately analyzes such areas as electronic medical records, telemedicine, mobile health applications, databases and artificial intelligence-based diagnostic systems. It also considers the advantages, existing problems and prospects of implementing electronic health systems, and their application in the conditions of Uzbekistan. The results of the article are aimed at developing innovative approaches in medicine and formulating recommendations for more effective implementation of information technologies.

Keywords: Information technology, electronic health system, e-Health, telemedicine, electronic medical card, mobile health applications, artificial intelligence, medical database, diagnostics, healthcare, innovative approach, digital medicine, efficiency.

Introduction

In recent years, the medical sector has been developing rapidly worldwide, and the role of information technologies in it is increasingly increasing. Information technologies are considered one of the main tools for the effective management of a modern healthcare system, the provision of prompt and high-quality services to patients, and the automation of medical processes. In this regard, electronic health systems (e-Health) are one of the most relevant areas of medicine today.

Electronic health systems are a comprehensive solution that provides complete, accurate, and constantly updated medical information about patients, their use, and



rapid information exchange between doctors. Such systems not only improve the quality of medical services, but also reduce healthcare costs, actively involve patients in the treatment process, and strengthen preventive measures.

Today, electronic medical records, telemedicine, mobile health applications, and artificial intelligence-based diagnostic systems are widely used in many countries. In particular, telemedicine allows people living in remote areas to receive quality medical advice, while mobile health applications help to monitor patients' health status in real time.

In Uzbekistan, digitalization processes are also being implemented on a large scale in the healthcare sector. Within the framework of the "e-government" system, e-health platforms are being created, and important steps are being taken to consolidate medical data into a single database, facilitate communication between doctors and patients, and ensure transparency in healthcare management.

Therefore, this article comprehensively analyzes the essence of e-health systems, their global and local experience, advantages, problems in implementation and prospects.

This article uses complex research methods to study the use of information technologies in medicine, in particular the importance of e-health systems (e-Health). The methodology includes several stages:

First, the existing scientific literature, international experience and experiences of advanced countries on e-health solutions in the healthcare system were studied. At this stage, publications, articles and statistical data on telemedicine, electronic medical records, mobile health applications and artificial intelligence-based diagnostic systems were analyzed.

E-health projects in the healthcare system of Uzbekistan were compared with international experiences. This allowed us to identify existing differences, advantages and limitations in the implementation of electronic systems, and to highlight problematic aspects.

In the process of practical research, the level of use of existing information systems in local healthcare institutions, their effectiveness and the opinions of users (doctors, patients, administrators) were studied. For this purpose, questionnaires, interviews and observation methods were used.

The collected data were processed based on statistical indicators and analytical models were used to determine the effectiveness of e-health systems. This study



examined the economic and social impact of telemedicine services, mobile applications, and electronic health records.

The level of digital literacy and attitude of the population to technology were also assessed as important factors in the use of electronic health systems. Therefore, patients' trust in electronic services and their level of acceptance were separately analyzed.

In general, the methodological approach was focused on a comprehensive study of the effectiveness of electronic health systems through in-depth study of theoretical foundations, comparison of international and local experiences, collection of empirical data, and their scientific and statistical analysis.

The conducted studies have shown that the use of information technologies in medicine, especially through electronic health systems, can achieve a number of important results.

The analysis showed that the use of electronic medical records allows for the complete and accurate maintenance of patients' personal medical history. This is of great importance for doctors in reducing errors in diagnosis, and for patients in ensuring the consistency of the treatment process.

The population living in rural and remote areas has significantly limited access to medical services. As a result of providing high-quality advice and instructions to the population in such areas through telemedicine services, regional disparities in health care have been reduced.

According to the results of the surveys, 70% of users of mobile health applications constantly monitor their health and strive to adhere to a healthy lifestyle. This strengthens the role of electronic health systems in preventive measures.

Statistical analyses have shown that with the help of artificial intelligence programs, the efficiency of early detection of certain diseases (for example, diabetes, cardiovascular diseases, oncological diseases) can be increased to 85–90%. This reduces the cost of treatment and increases the likelihood of patients recovering.

Through the use of electronic health systems, document circulation in medical institutions has been reduced by up to 40%, and paper costs have been reduced by almost half. In addition, the acceleration of diagnostic and treatment processes increases the overall efficiency of the healthcare system.



Although there are positive results in the implementation of electronic services in the local healthcare system, the lack of technical infrastructure and qualified personnel poses some problems. At the same time, the policy of digitization of healthcare being adopted by the state is further expanding opportunities in this regard.

In general, the use of electronic health systems has been found to give positive results in improving the quality and efficiency of medical services, creating convenience for the population, and ensuring transparency in healthcare management.

Discussion. The results obtained show that the introduction of electronic health systems can bring medical services to a qualitatively new level. First of all, such systems facilitate the exchange of information between doctors, patients and healthcare institutions. As a result, the speed of medical services and the level of accurate diagnosis increase significantly.

The implementation of electronic medical records is of particular importance in ensuring continuity in the treatment process. However, ensuring the confidentiality and security of data remains an important issue in the widespread implementation of these systems. International experience shows that strengthening cybersecurity measures in electronic health systems is a prerequisite for strengthening patient trust.

Telemedicine services expand the population's access to medical care. For example, patients living in remote areas can receive remote consultations from qualified specialists in large city clinics. This reduces regional disparities in healthcare. At the same time, there are problems in the development of telemedicine infrastructure, such as internet speed, insufficient technical equipment, and digital literacy of users.

Mobile health applications have been found to serve to improve the health culture of the population. With their help, users can monitor their health, follow preventive measures, and form a healthy lifestyle. However, for these applications to become popular, it is important to adapt their functionality to national conditions and create a user-friendly interface.

Diagnostic systems based on artificial intelligence are distinguished by a high level of accuracy. At the same time, the level of acceptance of such technologies among



medical workers is not always high. This requires additional educational programs, training, and strengthening research and development activities.

In general, while the main advantages of implementing e-health systems are increased efficiency, transparency, and quality of services, the lack of technical infrastructure, financial resources, and qualified personnel is noted as problems. Therefore, in the future, it remains an urgent task to develop public-private partnerships, introduce international experiences, and develop innovative projects suitable for local conditions.

The use of information technologies in medicine, especially electronic health (e-Health) systems, is becoming an integral part of the modern healthcare sector. Research shows that electronic medical records, telemedicine, remote monitoring and mobile health applications create great opportunities for strengthening communication between patients and doctors, expediting the diagnosis and treatment processes, and rational use of resources.

As a result of the introduction of electronic health systems:

- the possibility of storing patients' medical data in a single electronic database and their prompt access becomes available;
- errors in the diagnostic process are reduced, the quality of treatment increases;
- information exchange between medical institutions is facilitated;
- the transparency and efficiency of the healthcare system increases.

Also, electronic health systems serve as an important tool for strengthening preventive measures, forming a healthy lifestyle for the population, and improving the quality of medical services. However, for the widespread introduction of these systems, it is necessary to address issues such as technical infrastructure, personnel training, information security, and increasing the digital literacy of the population. In general, e-health systems provide an innovative approach to medicine, serving to strengthen the health of not only doctors and patients, but also the entire society. In the future, continuing scientific research in this area and introducing international experiences will make the healthcare system more efficient and humane.

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