AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 05. MAY ,2026

THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) IN THE PROFESSIONAL ACTIVITIES OF HEALTHCARE WORKERS

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Abstract. This article analyzes the role and importance of information and communication technologies (ICT) in the modern healthcare system. It highlights the impact of ICT on diagnostics, treatment, monitoring, management, and medical education processes. In addition, the advantages of electronic healthcare systems, electronic medical records, and e-prescription systems, as well as their role in ensuring patient safety, are examined. The article substantiates that the implementation of ICT leads to improved quality of medical services, reduction of clinical errors, and increased efficiency of healthcare professionals' activities.

Keywords. information and communication technologies, ICT, e-health, electronic medical record, e-prescription, telemedicine, diagnostics, artificial intelligence, medical education, digitalization, clinical decision-making, patient safety, healthcare system, medical management, remote services.

Modern healthcare systems are undergoing significant transformation under the influence of globalization and digitalization processes. Information and communication technologies (ICT) have become an integral part of the medical field, serving not only to improve the quality of healthcare services but also to organize the professional activities of healthcare workers more effectively.

Today, ICT is taking healthcare systems to a new level by optimizing diagnostics, treatment, monitoring, management, and educational processes in medicine. As specialists emphasize, "the introduction of digital technologies significantly increases the speed, accuracy, and safety of healthcare systems."

The overall importance of ICT in medicine is extremely significant. The integration of ICT into healthcare has resulted in several positive outcomes:

- The exchange of medical information has accelerated - laboratory results, imaging diagnostics data, and clinical protocols can now be transmitted within seconds.
- The quality of clinical decision-making has improved - Clinical Decision Support Systems (CDSS) provide physicians with accurate and evidence-based recommendations.
- Paper documentation has decreased - documentation processes have been automated through electronic systems.
- Medical errors have been reduced - standardized electronic systems minimize errors caused by the human factor.
- Remote healthcare services have developed - telemedicine has expanded access to healthcare services for patients living in remote areas.

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According to some studies, effective use of ICT can reduce clinical errors by up to 20–30%.

Electronic healthcare systems are among the most important areas of ICT, serving to fully digitalize healthcare processes. In particular, electronic medical records (EMRs) collect all patient-related information in a unified database, including:

- Medical history (anamnesis)
- Laboratory results
- Instrumental examinations
- Treatment history

This system enables physicians to quickly access necessary information. Researchers note that "electronic medical record systems significantly improve the accuracy of clinical decision - making."

The electronic prescription system is an important component of the modern healthcare system, ensuring accuracy, speed, and safety in the medication prescribing process through digitalization. Unlike traditional paper prescriptions, electronic prescriptions are created, stored, and transmitted to pharmacies through specialized information systems. This significantly simplifies information exchange among healthcare professionals, pharmacists, and patients.

Electronic prescription systems provide several important advantages:

- ❖ They reduce the risk of incorrect prescriptions - drug names are standardized within the system, eliminating misunderstandings caused by illegible handwriting.
- ❖ They help determine accurate dosages - electronic systems automatically monitor dosage, duration, and frequency of medication use and warn about incorrect dosages.
- ❖ They automatically check drug interactions - when multiple medications are prescribed simultaneously, the system analyzes their compatibility and alerts physicians about dangerous combinations.

In addition, electronic prescription systems create further opportunities:

- ✓ They facilitate medication selection based on the patient's previous treatment history.
- ✓ They take allergic reactions and contraindications into account.
- ✓ They allow prescriptions to be stored and reviewed later.
- ✓ They help prevent fraudulent prescriptions.
- ✓ They control medication supply through direct integration with pharmacies.

As a result, patient safety significantly improves, pharmaceutical errors decrease, and treatment processes become more effective. Research shows that electronic prescription systems are important tools in reducing medication-related errors and improving the overall efficiency of healthcare systems.

ICT has also brought revolutionary changes to the field of diagnostics. Modern technologies provide the following opportunities:

- ❖ Digital imaging technologies (CT, MRI, ultrasound) provide highly accurate images.
- ❖ Artificial intelligence systems assist in the early detection of diseases.
- ❖ Laboratory Information Systems (LIS) rapidly process test results.

Scientific sources indicate that the accuracy of detecting certain diseases with the help of artificial intelligence has exceeded 90%.

ICT also offers several advantages in the treatment process, which is one of the most important areas in medicine:

- ❖ Treatment plans are created and monitored electronically.
- ❖ Patient conditions are monitored in real time.

AMERICAN ACADEMIC PUBLISHER
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- Drug interactions are automatically calculated.
- The system provides alerts in dangerous situations.

In addition, virtual simulators and interactive devices are widely used in rehabilitation processes. This accelerates patient recovery.

Information and communication technologies (ICT) have fundamentally modernized medical education, making it more flexible, modern, and efficient. Alongside traditional forms of education, the broad implementation of digital technologies is creating new opportunities for healthcare professionals.

First, opportunities for distance education through online courses and webinars have expanded. Healthcare workers and students can now gain knowledge from leading international specialists regardless of geographical location. This significantly accelerates knowledge exchange and professional development.

Second, virtual simulators make it possible to develop practical skills. Such technologies allow complex surgical procedures to be practiced repeatedly in a safe environment. As a result, errors decrease and specialists gain confidence.

Third, electronic libraries and scientific databases provide quick access to necessary information. Physicians can regularly familiarize themselves with the latest scientific articles, clinical guidelines, and research findings.

Experts emphasize that “digital educational platforms ensure the continuous professional development of healthcare workers.” This is an important factor in preparing highly qualified specialists in modern medicine.

ICT is important not only in treatment and education but also in the effective management of healthcare institutions. Digital management systems make organizational activities more structured and transparent.

First of all, they enable efficient use of resources. The movement of medications, medical equipment, and financial resources can be monitored accurately, preventing unnecessary expenditures.

They also facilitate the monitoring of staff performance. The efficiency, workload, and outcomes of each healthcare worker can be analyzed, helping managers make more evidence-based decisions.

Optimization of planning is another important advantage of ICT. Managing patient flow, scheduling appointments, and coordinating healthcare services become easier.

Furthermore, automated reporting reduces errors associated with the human factor. Statistical data can be generated quickly and accurately, expanding opportunities for analysis and forecasting.

Another important aspect is ensuring data security. Modern information systems play a crucial role in protecting patient information, maintaining confidentiality, and preventing unauthorized access.

As a result, healthcare institutions that implement ICT experience increased overall efficiency, simplified management processes, and, most importantly, significantly improved quality of patient care.

Conclusion

In conclusion, information and communication technologies are important factors in organizing the professional activities of healthcare workers effectively. The implementation of ICT improves diagnostic accuracy, enhances treatment quality, optimizes management processes, and ensures patient safety. Therefore, the use of ICT in healthcare will continue to expand in the future and remain one of the key drivers of healthcare system development.

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