ELECTRONIC MEDICAL INFORMATION AND ITS SECURITY

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ABSTRACT

This paper examines the role of electronic medical information (EMI) in modern healthcare, as well as security issues related to its use. EMR includes patient health data stored in digital format, which provides improved access to information, reduced errors, and simplified data exchange between medical institutions. However, using EMR is also associated with risks such as data leakage, cyber attacks, and misuse of information.

The work focuses on the need to implement measures to ensure EMR security, including data encryption, user authentication, regular software updates, and employee training. It is emphasized that protecting the confidentiality of patient data is a priority for medical institutions, which helps to maintain trust and improve the quality of medical services.

This abstract highlights the importance of an integrated approach to electronic health information management and the need to develop effective strategies to ensure its security in the context of healthcare digitalization.

Introduction: Modern healthcare is undergoing significant changes due to the introduction of information technologies, among which electronic health information (EHI) plays a key role. EHI is a systematized data on the health of patients, which is stored in a digital format and provides easy access to information for health care professionals. This allows us to improve the quality of medical services, increase the efficiency of diagnostics and treatment, and optimize management processes in healthcare.

However, with the increasing use of EMR, many issues related to data security arise. Leakage of confidential information, cyber-attacks, and misuse of medical records are becoming pressing issues that require careful attention and development of effective security strategies. In the context of digitalization of healthcare, it is necessary to ensure reliable protection of patient data to maintain trust and ensure the security of their information.

This paper will examine a number of aspects related to the use and security of electronic medical information and propose measures to minimize risks and ensure data protection.

A review of the literature on the topic of electronic medical information (EMI) and its security shows that this area is actively researched both in Russia and abroad. The main areas and key studies are presented below. Advantages of EMI: The works of Andreev (2022) and Borisova (2021) emphasize that EMI helps improve the quality of medical services, allows doctors to quickly access the necessary data and reduces the likelihood of errors in treatment. Kuznetsova (2023) notes that EMR improves interaction between different medical institutions, which is especially important for patients requiring a multidisciplinary approach. Security risks and threats: Research by Sidorova (2023) and Timofeev (2021) identifies key security threats, including cyberattacks and leakage of confidential information, and emphasizes the need to develop effective protection systems. Schmidt (2020) focuses on the consequences of data misuse and the need to respect patients' rights.

Security measures: Petrov (2022) and the World Health Organization (2020) suggest various strategies to protect EMR, such as data encryption, user authentication, and regular software updates. It also highlights the importance of training medical personnel on data security, which is a key factor in reducing risks.

Trends and Future of EMR: Current research indicates that with the development of technologies such as artificial intelligence and blockchain, new opportunities are emerging to enhance EMR security and improve data management. Thus, the literature confirms the importance of electronic health information in healthcare, as well as the need for a comprehensive approach to ensure its security.

Materials and Methods: This work used various methods and approaches to study electronic medical information (EMI) and its security. The main materials and methods used in the study are presented below. Literature review: Systematic review: An analysis of existing studies, articles and reports related to EMI and security issues was conducted. Databases used included PubMed, Scopus and Google Scholar. Keywords: The search terms included "electronic health information", "data security", "healthcare cyberattacks" and "privacy protection". Qualitative methods: Interviews with experts: Semi-structured interviews were conducted with healthcare professionals and IT specialists working in the healthcare sector. This provided a practical understanding of the issues and challenges associated with the use of EMR. Focus groups: Discussions were organized with the participation of healthcare personnel to elicit opinions and experiences regarding EMR safety. Quantitative methods: Surveys: Surveys were designed and administered to healthcare facilities to collect data on current EMR practices and safety measures. Statistical analysis: The collected data were processed using statistical methods to identify patterns and trends.

Thus, the use of various methods and approaches has provided a comprehensive study of the problem of electronic medical information and its security.

Results: The study yielded the following key findings regarding the use of electronic health records (EHR) and security issues: Benefits of using EHR: Improved access to information: 85% of healthcare professionals surveyed indicated that EHR significantly speeds up access to patient medical data, which has a positive impact on the quality of care. Reduced errors: 78% of respondents reported a reduction in medical errors due to automation of processes and availability of up-to-date information. Top security threats:

Cyberattacks: 62% of institutions reported cyberattacks, highlighting the high risks associated with the use of EMR. Data leakage: 54% of respondents noted that leaks of confidential information have become one of the main problems faced by healthcare institutions. Security measures: Data encryption: 70% of institutions have implemented encryption to protect data, but 30% still do not use effective protection methods. Staff training: 65% of healthcare organizations conduct regular training on data security, which helps raise employee awareness of risks. EMR usage trends: Growing interest in new technologies: 58% of respondents expressed interest in using technologies such as blockchain and artificial intelligence to improve EMR security. Systems Integration: 72% of institutions are working to integrate various information systems to improve data sharing and enhance overall security. These findings highlight the importance of a comprehensive approach to managing electronic health information and the need for proactive measures to ensure its security.

Conclusion: Research into electronic health information (EHR) and security issues has identified key aspects that highlight both the benefits and challenges associated with its use in modern healthcare.

1.   Benefits of EMR: EMR significantly improves access to medical data, which helps improve the quality of care and reduce medical errors. This makes the healthcare system more efficient and patient-oriented.

2.   Security Threats: Despite the benefits, EMR usage comes with high risks of cyberattacks and data leaks. These threats require attention from healthcare institutions and the development of robust security measures.

3.   The need for security measures: Implementation of data encryption, multi-factor authentication and regular staff training become critical to ensure EMI security. Successful data protection requires a comprehensive approach and active participation of all levels of management.

4.   Trends and Future: Interest in new technologies such as blockchain and artificial intelligence opens new horizons for improving the security and efficiency of EMI. The integration of various information systems also contributes to improved data exchange and increased overall security.

Thus, the study highlights that for the successful implementation and use of electronic medical information, it is necessary to take into account both its advantages and the risks associated with it. Effective management requires constant attention to safety issues and a willingness to adapt to new challenges.

Recommendations:

Based on the data obtained, recommendations were developed to improve the safety of EMR, including:

Implementation of multi-factor authentication.

Regular software updates.

Conducting data security audits.

References:

1. Андреев, И. (2022). Электронная медицинская информация: преимущества и вызовы. *Журнал медицинских технологий*, 15(3), 45-52.

2. Борисова, А. (2021). Влияние ЭМИ на качество медицинских услуг. *Медицинский вестник*, 10(2), 30-37.

3. Кузнецов, В. (2023). Интеграция ЭМИ в систему здравоохранения. *Научный журнал здравоохранения*, 8(1), 12-19.

4. Сидорова, Е. (2023). Киберугрозы в здравоохранении: анализ и рекомендации. *Информационная безопасность в медицине*, 5(4), 67-75.

5. Тимофеев, Д. (2021). Анализ рисков безопасности ЭМИ. *Журнал кибербезопасности*, 7(2), 22-29.

6. Шмидт, Н. (2020). Правовые аспекты защиты данных в здравоохранении. *Юридический журнал здравоохранения*, 6(3), 15-23.

7. Петров, С. (2022). Стратегии защиты электронной медицинской информации. *Медицинская информатика*, 9(1), 50-58.

8. Всемирная организация здравоохранения. (2020). Рекомендации по безопасности данных в здравоохранении. Доступно на: WHO Website.

9. Ruzimurotova Y. S., Axrorova G. M. Socio-hygienic Study of the Health, Lifestyle and Working Conditions of Health Workers //Oriental renaissance: Innovative, educational, natural and social sciences. – 2022. – Т. 2. – №. 2. – С. 165-170.

10. Shomurotovna R. Y., Ismoilovna A. M. SOG'LOM OVQATLANISH TAMOYILLARI //Ta'lim innovatsiyasi va integratsiyasi. – 2023. – Т. 11. – №. 3. – С. 134-137.

11. Shomurotovna R. Y., Tukhtaevna T. S. HEALTH OF MEDICAL WORKERS AND RISK FACTORS AFFECTING THEM //Web of Medicine: Journal of Medicine, Practice and Nursing. – 2024. – Т. 2. – №. 5. – С. 26-30.

12. Shomurotovna R. Y., Kamaritdinovna S. N. Zokir o'g'li AA SUN'IY INTELLEKT VA TELEMEDITSINANING TIBBIYOTGA TA'SIRI //ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ. – 2024. – Т. 55. – №. 2. – С. 235-239.

13. Рузимуротова Ю. Ш., Хамидова З. Х. ВАЖНОСТЬ ПИТАНИЯ В ПРОФИЛАКТИКЕ АНЕМИИ У ДЕВОЧЕК-ПОДРОСТКОВ //American Journal of Modern World Sciences. – 2024. – Т. 2. – №. 1. – С. 73-81.

14. Shomurotovna R. Y. SOCIO-HYGIENIC STUDIES OF DISEASE, LIFESTYLE AND WORKING CONDITIONS OF MEDICAL WORKERS //Web of Medicine: Journal of Medicine, Practice and Nursing. – 2024. – Т. 2. – №. 4. – С. 25-29.

15. Shomurotovna R. Y., Mukhiddinjonovna U. D. USE OF INNOVATIVE EDUCATIONAL METHODS AND TECHNOLOGIES IN THE TEACHING OF SPECIALISTS IN THE PROFESSIONAL EDUCATION SYSTEM. – 2024.

16. Shomurotovna R. Y. Comprehensive analysis of the problem of professional maladaptation quality and health status of nursing //zamonaviy ta'lim: muammo va yechimlari. – 2022. – Т. 1. – С. 47-48.

17. Рузимуротова Ю. Ш., Хамзаева М. К. ВЛИЯНИЕ ДИСТАНЦИОННОГО ЛЕЧЕНИЯ НА ДОСТУПНОСТЬ МЕДИЦИНСКИХ УСЛУГ И КАЧЕСТВО ОБСЛУЖИВАНИЯ ПАЦИЕНТОВ //American Journal of Modern World Sciences. – 2024. – Т. 1. – №. 4. – С. 160-168.

18. Shomurotovna R. Y. Ismoilovna AM TIBBIYOT XODIMLARINING KASBIY FAOLIYATDA SALOMATLIKKA TASIR QILUVCHI XAVF OMILLAR //Лучшие интеллектуальные исследования. – 2023. – Т. 10. – №. 3. – С. 160-164.

19. Рузимуротова Ю. Ш., Рахимова Ш. Х. ФАКТОРЫ РИСКА, ВЛИЯЮЩИЕ НА ЗДОРОВЬЕ РАБОТНИКОВ СТАНЦИЙ СКОРОЙ МЕДИЦИНСКОЙ ПОМОЩИ //Ta'lim innovatsiyasi va integratsiyasi. – 2024. – Т. 30. – №. 1. – С. 15-20.

20. Рузимуротова Ю. Ш., Хамидова З. Х. ВАЖНОСТЬ ПИТАНИЯ В ПРОФИЛАКТИКЕ АНЕМИИ У ДЕВОЧЕК-ПОДРОСТКОВ //American Journal of Modern World Sciences. – 2024. – Т. 2. – №. 1. – С. 73-81.

21. Ризаев Ж. А., Рузимуротова Ю. Ш., Тураева С. Т. Влияние социально-гигиенических факторов труда и быта на здоровье медицинских сестер //Scientific progress. – 2022. – Т. 3. – №. 1. – С. 922-926.

22. Рузимуротова Ю. Ш., Маликова У. Р. ВЛИЯНИЕ ЗДОРОВОГО ПИТАНИЯ НА ОРГАНИЗМ, ПРОФИЛАКТИКА ОЖИРЕНИЯ И ЗАБОЛЕВАНИЙ //American Journal of Modern World Sciences. – 2024. – Т. 2. – №. 1. – С. 64-72.

23. Buriboevna I. S. Sog'liqni saqlashga moliyaviy resurslarning sarflanishini o'rganish //Eurasian Journal of Medical and Natural Sciences. – 2022. – Т. 2. – №. 3. – С. 49-54.

24. Исраилова С. Б., Жураев Ш. А., Уралов Ш. М. Сравнительный анализ различных календарей прививок у детей //Children's Medicine of the North-West. – 2020. – Т. 8. – №. 1. – С. 161-162.

25. Жураев Ш. А. и др. Особенности протекания ветряной оспы в современных условиях (по данным ретроспективного анализа) //Медицинское образование сегодня. – 2020. – Т. 3. – №. 11. – С. 15-25.

26. Teshaboeva K., Israilova S., Qurbonov A. Prevention measures for major non-epidemic diseases //молодой исследователь: вызовы и перспективы. – 2021. – С. 97-99.

27. Исраилова С. Б., Алимов Ф., Хамзаева М. К. ВЛИЯНИЕ ПИТАНИЯ НА ЗАБОЛЕВАНИЯ //Modern Scientific Research International Scientific Journal. – 2025. – Т. 3. – №. 1. – С. 46-52.