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**THE MANIFESTATION OF CHARACTERISTICS, OPPORTUNITIES AND CHALLENGES OF
ELECTRONIC SYSTEMS AND DIGITAL INTELLIGENCE USING IN PHARMACEUTICAL
SERVICES**

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**ფარმაცევტულ სერვისებში გამოყენებული ელექტრონული სისტემებისა და ციფრული
ინტელექტის მახასიათებლების თავისებურებები**

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რეზიუმე

კვლევის მიზანი იყო ფარმაცევტულ სერვისებში ელექტრონული სისტემებისა და ციფრული ინტელექტის მახასიათებლების, შესაძლებლობებისა და გამოწვევების შესწავლა. ხელოვნური ინტელექტის ინტეგრირება სააფთიაქო პრაქტიკაში წარმოადგენს შესაძლებლობებსა და გამოწვევებს. ხელოვნური ინტელექტის სისტემები გვირდებიან დააჩქარონ ამოცანების შესრულება და გააუმჯობესონ ოპერაციული ეფექტურობა, მაგრამ არის გამოწვევები, რომლებიც უნდა დაიძლიოს ხელოვნური ინტელექტის დანერგვის, ექსპლუატაციისა და გაუმჯობესებისას. საჭირო ფინანსური მხარდაჭერით და ყოვლისმომცველი განათლებისა და ტრენინგის ინიციატივებით, ამ გამოწვევების დაძლევა შესაძლებელია. გარდა ამისა, მნიშვნელოვანია ხაზი გავუსვათ იმ სარგებელსა და დამატებულ ღირებულებას, რომელსაც ხელოვნური ინტელექტის სისტემები მოაქვს ფარმაცევტული ზრუნვის სექტორში გამოწვევების შესამცირებლად და პაციენტთა მოვლისა და შედეგების გაუმჯობესების პოტენციალის დემონსტრირებისთვის. ჯანდაცვის მუშაკებსა და პაციენტებს შორის გადანაცვების საერთო მიღება მოითხოვს ნდობას, პარტნიორობის გრძობას და გამჭვირვალობას მათ ურთიერთქმედებაში. ფარმაცევტულ პროფესიას აქვს იდეალური შესაძლებლობები და კომპეტენციები, რომ უზრუნველყოს მეტი ციფრული ჯანდაცვის სერვისები პაციენტებისთვის.

Introduction: Improving artificial intelligence technologies in pharmaceutical practice faces many obstacles. The pharmacy best practices that Artificial Intelligence (AI) can potentially improve, as well as the benefits that AI can provide in terms of treatment protocols and patient outcomes. Another major obstacle to improving AI in pharmaceutical practice is the difficulty of accessing modern artificial intelligence models and algorithms. This challenge can hinder the integration of the most effective and advanced AI solutions into pharmaceutical operations and lead to challenges in patient care and operational efficiency. Achieving a balance between developing AI capabilities and maintaining ethical standards requires the creation of comprehensive frameworks to guide the development and improvement of AI systems. Effective collaboration ensures that pharmaceutical professionals share the information they need to gain valuable knowledge and experience in the field of artificial intelligence. This, in turn, is facilitating the development of artificial intelligence tools that can be fully leveraged to improve pharmaceutical practices and patient outcomes [1-3].

Aim of the research was to study and analyze characteristics, opportunities and challenges of electronic systems and digital intelligence in pharmaceutical services.

Methodology: The material of the article was the revised data from scientific publications, which were processed, analyzed, overviewed and reviewed by generalization and systematization. Research studies are based on a review/overview assessment of the development of critical visibility and overlook of the modern scientific literature. Use the following databases (for extensive literature searches to identify characteristics, opportunities and challenges of electronic systems and digital intelligence in pharmaceutical services): PubMed, Web of Science, Clinical key, Tomson Reuters, Google Scholar, Cochrane Library, and Elsevier Foundations.

Results and discussion. Many digital health technologies rely heavily on understanding and proper use by healthcare professionals. There is a clear need for greater focus, concerted action and investment in education, training and skills development to ensure that healthcare professionals understand and use digital health to realize the expected benefits. Universities and education providers provide digital medical education, with most programs focusing on certificate delivery models. There is a lack of digital medical education and training, and an initiative focused on the national or professional level could be an incentive to integrate into education. Pharmacy as a profession is historically associated with information technology. Hence, it has the ideal abilities and competencies to provide more digital healthcare services to patients. Realizing the full potential of digital health requires a confident, capable, agile and digitally savvy pharmaceutical workforce. Only with improved education and training will the pharmaceutical workforce be able to keep pace with the digital transformation of healthcare. Digital health is largely shaped by experts outside of the health sector and this provides an opportunity for interdisciplinary collaboration to develop the foundation of digital health education. Education in pharmacy and pharmaceutical sciences must be needs-based to meet the current and changing demands of digital health [4,5].

An electronic health record (EHR) is a digital version of a patient's paper chart. EHRs are real-time, patient-centric records that make information available instantly and securely to authorized users. Although EHRs contain patients' medical and treatment histories, an EHR system is designed to go beyond the standard clinical data collected in a provider's office and can encompass a broader view of patient care. Pharmacists provide continuous medical care to patients and should be active participants in the electronic health record, information retrieval and documentation. The use and implementation of the EHR is driven by changes in funding and policy, and pharmacists should be part of the development and implementation teams. As healthcare information technology proliferates and eHealth records are developed and implemented in the healthcare environment, it is essential that the workflows and information needs of pharmacists are met in eHealth records to optimize the quality of drug therapy and patient outcomes. Although pharmacists use many different advanced features of electronic health records, three main areas of their application are described in the literature: documentation, drug reconciliation, and patient evaluation and monitoring [6,7].

E-Prescribing and e-dispensing- e-Prescribing is a prescriber's ability to electronically send an accurate, error-free and understandable prescription directly to a pharmacy from the point of care. It is an important element in improving the quality of patient care. e-Dispensing is defined as the act of electronically retrieving a prescription and giving out the medicine to the patient as indicated in the corresponding e-prescription. Once the medicine is dispensed, the dispenser reports via software information about the dispensed medicine(s). The benefits of both technologies include enhanced patient safety, reduced drug costs, increased access to patient prescription records, and improved pharmacy

workflow [8-9]. Electronic prescribing and electronic dispensing-is the ability for a prescriber to electronically submit an accurate, error-free, and understandable prescription directly from the point-of-care pharmacy. This is an important element in improving the quality of patient care. Electronic dispensing is defined as receiving a prescription electronically and dispensing a drug to a patient as specified in the corresponding electronic prescription. Once a drug is dispensed, the dispenser provides the program with information about the dispensed drugs. The benefits of both technologies include improved patient safety, lower drug costs, increased access to patient prescription records, and improved pharmacy efficiency [3,5,8].

Improving artificial intelligence technologies in pharmaceutical practice faces many obstacles. The biggest one is the lack of research examining the effectiveness, applicability, and outcomes of implementing artificial intelligence in pharmaceutical practice. With AI playing an important role in healthcare sectors such as the pharmaceutical direction, it is imperative to ensure ethical, fair, secure and error-free decision-making processes. Effective collaboration allows the exchange of information between pharmacy specialists, which is important for obtaining valuable information and knowledge in the field of artificial intelligence. This, in turn, is facilitating the development of artificial intelligence tools that can be fully leveraged to improve pharmaceutical practices and patient outcomes.

Conclusion: So integrating artificial intelligence into pharmacy practice presents opportunities and challenges. AI systems promise to speed up task completion and improve operational efficiency, but there are challenges that must be overcome in implementing, operating, and improving AI. Furthermore, it is important to highlight the benefits and added value that AI systems bring to the pharmaceutical care services to mitigate challenges and demonstrate the potential to improve patient care and outcomes.

References:

1. Ibrahim OM, Ibrahim RM, Meslamani AA, et al. Role of telepharmacy in pharmacist counselling to coronavirus disease 2019 patients and medication dispensing errors. *J Telemed Telecare*. 2023;29(1):18–27.
2. Halli-Tierney AD, Scarbrough C, Carroll D. Polypharmacy: evaluating risks and deprescribing. *Am Fam Physician* 2019;100(1):32–8.
3. Hudd TR, Tataronis GR. The impact of an urban telepharmacy on patient medication adherence in a federally qualified health center. *J Pharm Technol* 2011;27(3):117–22.
4. Health Care Payment Learning & Action Network. Measuring progress: adoption of alternative payment models in commercial, Medicaid, Medicare advantage, and Medicare fee-for-service programs, 2018. <https://hcp-lan.org/2018-apm-measurement/>. Accessed Dec 9, 2019.
5. Pednekar P, Peterson A. Mapping pharmacy deserts and determining accessibility to community pharmacy services for elderly enrolled in a State Pharmaceutical Assistance Program. 2018;13(6).
6. Qato DM, Daviglus ML, 'Pharmacy deserts' are prevalent in Chicago's predominantly minority communities, raising medication access concerns. *Health Aff (Millwood)* 2014;33(11):1958–65.
7. Crilly P, Kayyali R. A systematic review of randomized controlled trials of telehealth and digital technology use by community pharmacists to improve public health. *Pharmacy*. 2020. 8(3):137.
8. Badowski ME, Walker S, Bacchus S, et al.. Providing comprehensive medication management in telehealth. *Pharmacotherapy*. 2018;38(2):e7-e16.

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SUMMARY

Aim of the research was to study and analyze characteristics, opportunities and challenges of electronic systems and digital intelligence in pharmaceutical services. Integrating artificial intelligence into pharmacy practice presents opportunities and challenges. AI systems promise to speed up task completion and improve operational efficiency, but there are challenges that must be overcome in implementing, operating, and improving AI. With the necessary financial support and comprehensive education and training initiatives, these challenges can be overcome. It is important to highlight the benefits and added value that AI systems bring to the pharmaceutical care services to mitigate challenges and demonstrate the potential to improve patient care and outcomes. Shared decision-making between healthcare workers and patients requires trust, a sense of partnership and transparency in their interactions. Healthcare professionals become collaborators on the patient's journey to health, yet still provide empathy and a human touch to support patients' well-being. The pharmacy profession has the ideal aptitude and competencies to provide more digital healthcare services to patients.

Keywords: Electronic systems, digital intelligence, pharmaceutical services.

