https://doi.org/10.36290/csf.2025.037

Organizational challenges and benefits of electronic prescriptions in physicians' daily practice: Survey findings from Ukraine

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Background: Electronic prescriptions (e-prescriptions) are a key element of the digital transformation of Ukraine's healthcare system. However, their implementation and usage levels vary significantly depending on the physician's specialty, years of experience, and the type of locality. This study is relevant due to the need for empirical analysis of these differences to improve the e-prescription system and enhance its overall efficiency.
Objective: To assess the impact of e-prescriptions on the workflow of physicians from various specialties and to identify patterns associated with location, professional experience, and medical specialization.
Methods: The study is based on an online survey of 86 physicians from public and municipal healthcare institutions conducted between April 2024 and April 2025. Descriptive statistics, χ^2 tests for associations, and calculation of means with 95 % confidence intervals were used for data analysis.
Results: General practitioners and family physicians were more likely to use e-prescriptions, particularly in remote form (82,1 % vs. 26,7 % among specialists; $\chi^2 = 23{,}4$; $p < 0.001$). No statistically significant differences were found in the prescription of antibiotics ($\chi^2 = 0{,}74$; $p = 0{,}389$) compared to other medications. The highest-rated statement among respondents was "the e-prescription is useful in my work" (mean 4,39 ± 0,78), although 17 % of physicians reported that the procedure takes more than 6 minutes to complete.
Conclusion: A total of 82,1 % of general practitioners and family physicians use the remote e-prescription functionality. Despite the high overall evaluation of the e-prescription system (mean score 4,39 ± 0,78), 17 % of physicians reported spending over 6 minutes on its issuance, indicating the need for further technical optimization and user support.

Key words: e-prescription, antibiotics, electronic health system, physicians.

Organizační výzvy a přínosy elektronických receptův každodenní praxi lékařů: výsledky dotazníkového šetření z Ukrajiny

Pozadí: Elektronické recepty (e-recepty) představují klíčový prvek digitální transformace ukrajinského zdravotnického systému. Jejich zavádění a míra využívání se však výrazně liší v závislosti na odbornosti lékaře, délce praxe a typu lokality. Tato studie je relevantní vzhledem k potřebě empirické analýzy těchto rozdílů za účelem zlepšení systému e-receptů a zvýšení jeho celkové efektivity.
Cíl: Zhodnotit dopad e-receptů na pracovní proces lékařů různých specializací a identifikovat vzorce spojené s místem výkonu praxe, odbornými zkušenostmi a lékařskou specializací.
Metody: Studie je založena na online dotazníkovém šetření 86 lékařů ze státních a obecních zdravotnických zařízení, uskutečněném v období od dubna 2024 do dubna 2025. Pro analýzu dat byly použity deskriptivní statistiky, chí-kvadrát testy pro zjištění souvislostí a výpočet průměrů s 95% intervaly spolehlivosti.

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Cit. zkr: Čes. slov. Farm. 2025;74(4):E8-E14
Článek přijat redakcí: 7. 7. 2025
Článek přijat po recenzích: 12. 11. 2025

Výsledky: Praktici a lékaři rodinné medicíny častěji využívali e-recepty, zejména v dálkové formě (82,1 % vs. 26,7 % mezi odbornými specialisty; $\chi^2 = 23,4$; $p < 0,001$). Nebyly zjištěny statisticky významné rozdíly v předepisování antibiotik ($\chi^2 = 0,74$; $p = 0,389$) ve srovnání s jinými léčivy. Nejlépe hodnoceným tvrzením mezi respondenty bylo „e-recept je užitečný v mé práci" (průměr 4,39 ± 0,78), přesto 17 % lékařů uvedlo, že jejich vystavení trvá více než 6 minut.

Závěr: Celkem 82,1 % praktických lékařů a lékařů rodinné medicíny využívá funkci dálkového e-receptu. Navzdory celkově vysokému hodnocení systému e-receptů (průměrné skóre 4,39 ± 0,78) uvedlo 17 % lékařů, že vystavení receptu jim trvá více než 6 minut, což poukazuje na potřebu další technické optimalizace a podpory uživatelů.

Klíčová slova: e-recept, antibiotika, elektronický zdravotnický systém, lékaři.

Introduction

Electronic prescriptions (e-prescriptions) have become an integral element of modern drug-prescribing workflows. They are designed to streamline physicians' routine tasks, enhance patient safety, and improve oversight of medicine use – particularly antibiotics.

However, the roll-out of e-prescribing inevitably reshapes traditional work organisation in healthcare, affecting both the efficiency of physicians' daily activities and their job satisfaction. Understanding how e-prescriptions influence clinical workflows is therefore essential for identifying both the advantages and the potential pitfalls of this digital innovation. While e-prescribing reduces paperwork and cuts the time needed to issue a script, it simultaneously demands clinicians' adaptation to new technologies – touching not only technical, but also psychological factors such as user perception and readiness to embrace digital tools.

The e-prescription system in Ukraine was launched in 2019 within the framework of the national program "Available Medicines" (Dostupni liky). Under this program, the physician issues a prescription, the pharmacy dispenses the medicine, and the cost is reimbursed from the state budget only if the prescription is generated through the eHealth electronic system.

An important milestone was reached on August 1, 2022, with the introduction of electronic prescriptions for antibacterial medicines (ATC J01). Physicians were required to issue such prescriptions exclusively through the electronic health system. A transitional period allowing paper prescriptions was established until January 1, 2023.

The third stage was implemented under the Order of the Ministry of Health of Ukraine No. 1841 of October 11, 2022, which stipulated that, starting from November 1, 2022, electronic prescriptions would be used for narcotic and psychotropic medicinal products included in Schedules II–III of the Resolution of the Cabinet of Ministers of Ukraine No. 770 of May 6, 2000.

From April 1, 2023, the e-prescription system was extended to all prescription-only medicines. During the transitional period, patients may independently choose whether to receive a paper prescription (Form No. 1 or Form No. 3, depending on the drug category) or an electronic prescription, in which case the patient receives an SMS notification containing the prescription number and redemption code. If a healthcare facility lacks the technical capacity to issue an e-prescription, a paper prescription may be used; however, where such capacity exists, the physician is obliged to offer the electronic prescription option.

The introduction of the e-prescription system is also consistent with European Union (EU) directives. Considering Ukraine's European integration course, the country has undertaken commitments to harmonize its national legislation with that of the EU. The deployment of e-prescriptions aligns with Directive 2011/24/EU on patients' rights in cross-border healthcare, which provides for the electronic exchange of prescriptions among EU member states.

Starting July 1, 2025, all pharmacies licensed for the retail sale of medicinal products in Ukraine will be mandated to join the national reimbursement program "Available Medicines" (Dostupni liky), sign a contract with the National Health Service of Ukraine (NHSU), and dispense the medicines included in this program exclusively through the electronic prescription (e-prescription) system. The „Available Medicines" program is a state healthcare initiative aimed at improving access to essential treatment for patients with common chronic diseases, including cardiovascular disorders, bronchial asthma, and type 2 diabetes mellitus. Within this program, medicines are provided free of charge or with a partial co-payment, depending on the reimbursement list approved by the Ministry of Health of Ukraine.

To ensure equal access to medicines for residents of remote and frontline areas, additional measures have been implemented. These include the operation of 30 mobile pharmacy units across 17 regions, which have already served over 1,000 local communities, and the „Ukrposhta.Pharmacy" project, which enables patients to order medicines by phone with free home delivery through the national postal service. As of 2025, more than 16,600 pharmacies and pharmacy outlets across the country participate in the program. The mandatory integration of all pharmacies into the eHealth system and NHSU contracts is expected to strengthen transparency, accessibility, and efficiency within Ukraine's national pharmaceutical reimbursement framework.

Ukraine's National eHealth System follows a public-private partnership model. It consists of a central database (the state component) and multiple medical information systems (MIS; the private component). The state develops policy and regulation and maintains the central database. MIS vendors, in turn, implement the required functionality, safeguard data at the system level, and provide user-oriented services.

MIS platforms enable hospitals and pharmacies to automate their work and to exchange data with the central database. Physicians can enter, review, and share information; pharmacists can view and dispense prescriptions; patients can receive e-prescriptions, e-referrals, and other

digital services. After examining a patient, the physician creates an e-prescription, which is stored and transmitted via the MIS.

Within the MIS an e-prescription passes several stages: (i) creation of the request by the physician, (ii) activation of the prescription, (iii) creation of a redemption request by the pharmacy staff, and (iv) redemption itself. Each prescription is displayed under My prescriptions/Prescriptions with one of the following statuses: data entry unfinished, request submitted/created, active, dispensed, rejected, or expired [1].

In their review of e-prescription functionality, Esmaeil Zadeh and Tremblay note that "e-prescribing improves healthcare quality, increases the efficiency of drug ordering and dispensing, reduces medication errors, and generates savings across the health sector." At the same time, they caution that poor implementation may create new error types, diminish efficiency, raise drug costs, and endanger patient safety. The authors classify the root causes of such errors into four broad categories: human factors, technical issues, interface design, and organisational barriers [2].

The implementation of the e-prescription system in Ukraine has been supported primarily through educational and informational initiatives, rather than direct financial incentives for prescribers. The Ministry of Health of Ukraine , the National Health Service of Ukraine (NHSU), and the Electronic Health State Enterprise (eHealth) have organized regular webinars, online training sessions, and methodological materials to assist physicians in mastering the technical aspects of electronic prescribing and integrating eHealth tools into daily practice. These activities are part of the broader national program for digital transformation in healthcare.

For patients, the main form of support consists of public information campaigns, step-by-step online instructions, and regional hotlines that explain how to obtain and redeem e-prescriptions, especially within the "Available Medicines" reimbursement program. In addition, the NHSU contact center provides free consultation regarding e-prescription use, participating pharmacies, and available medicines.

At the initial stage of e-prescription implementation in Ukraine, patients could receive their first electronic prescription without visiting a doctor only if they had an acute or chronic condition. In all other cases - for example, during initial diagnosis, preventive consultations, or non-urgent medical visits - the physical presence of the patient was required for the issuance of their first e-prescription. This requirement has now been lifted. It means that even if a patient contacts a doctor remotely for the first time, the physician is legally permitted to issue an e-prescription without conducting an in-person examination. According to current regulations, a physician may issue an e-prescription based on a remote (online or telephone) consultation, provided that such interaction is properly documented in the national electronic health system (eHealth) and complies with the clinical standards approved by the Ministry of Health of Ukraine. The only exception applies to patients undergoing maintenance substitution therapy. In making such decisions, the physician must rely on information provided by the patient about their current health status, symptoms, and the data from their primary medical records. Moreover, the physician is required to record this remote interaction in the national eHealth system [3]. These changes are intended to simplify the process of prescribing and dispensing prescription medicines while minimizing instances of self-medication. One of the key advantages of the e-prescription system is the ability to obtain prescriptions remotely. To do so, patients should make prior arrangements with their family doctor, general practitioner, or pediatrician to allow for the possibility of receiving a prescription without an additional in-person visit. It is also important to agree on the mode of remote communication and clarify the most suitable time for contact, whether by phone or in writing [4].

The remote prescribing of medicines has gained particular significance in Ukraine under the conditions of martial law, due to frequent shelling, the destruction of medical infrastructure, and restrictions on the movement of both patients and healthcare providers.

In such circumstances, the electronic prescription has become a critically important tool for ensuring the continuity of treatment, maintaining control over the prescribing of medicines, and reducing the risk of self-medication.

Therefore, the study of e-prescriptions in the current Ukrainian context is of particular relevance and importance.

Objective. To determine the impact of e-prescriptions on the workflow of physicians from various specialties and to identify patterns associated with the type of locality, years of professional experience, and medical specialty.

Materials and Methods

This cross-sectional study was conducted using an online survey method. The questionnaire was developed in Google Forms and distributed among physicians working in public and municipal healthcare institutions across Ukraine. Participation was voluntary, and all respondents were informed about the purpose of the study prior to completing the questionnaire. The questionnaire included both closed- and open-ended questions aimed at assessing physicians' experience with e-prescriptions, frequency of use, and their evaluation of the convenience and effectiveness of the system, particularly its remote functionality. Preliminary validation of the instrument was carried out through expert review and pilot testing on a group of physicians (n = 10). Identified shortcomings were corrected prior to the main phase of data collection. Data collection was conducted over a one-year period, from April 1, 2024 to April 1, 2025. A total of 86 valid responses were collected. Descriptive statistics (frequencies, percentages, means, standard deviations) were calculated using Microsoft Excel 365 and STATISTICA 12 software. The χ^2 (chi-square) test was used to assess statistically significant differences between groups. Attitudes toward e-prescriptions were measured using a 5-point Likert scale, with mean scores reported alongside 95% confidence intervals. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki by the World Medical Association. All participants provided informed consent prior to participation.

Results

Respondent Characteristics

A total of 86 physicians participated in the study (Table 1). Of these, 65,1 % (n = 56) were general practitioners or family physicians, while 34,9 % (n = 30) represented other medical specialties.

The majority of respondents across both groups had 11 to 20 years of professional experience (31,4 %). Physicians with less than five years of experience accounted for 12,8 % of the sample. Notably, 43,0 % of participants held the highest qualification category, indicating a high level of professional experience, typically over 15 years. Meanwhile, 22,1 % of physicians reported having no formal qualification category.

Most respondents practiced in urban areas (48,8 %), while 30,2 % provided medical services in rural localities. Regionally, the highest number of participants was recorded from Rivne Oblast (76,7 %), followed by Ivano-Frankivsk Oblast (17,4 %). Smaller proportions of participants were from Poltava Oblast (4,7 %) and Vinnytsia Oblast (1,2 %).

Tab. 1. *Respondent Characteristics*

Characteristic	n	%
Specialty		
General practitioners and family doctors	56	65,1
Other specialties	30	34,9
Total	86	100
Experience		
< 5 years	11	12,8
5–10 years	19	22,1
11–20 years	27	31,4
21–30 years	13	15,1
> 30 years	16	18,6
Total	86	100
Qualification*		
No category	19	22,1
Second category	14	16,3
First category	16	18,6
Highest category	37	43,0
Total	86	100
Location		
Rural area	26	30,2
Town	18	20,9
City	42	48,8
Total	86	100
Region		
Rivne Oblast	66	76,7
Ivano-Frankivsk Oblast	15	17,4
Poltava Oblast	4	4,7
Vinnytsia Oblast	1	1,2
Total	86	100

** The qualification category of physicians is an official indicator of the level of professional competence that reflects a physician's theoretical knowledge, practical skills, and work experience in a specific medical specialty. The category is awarded based on the results of attestation conducted by certification commissions of healthcare authorities in accordance with the Order of the Ministry of Health of Ukraine No. 446 of February 22, 2019. „On the Approval of the Regulation on the Attestation of Physicians."*
In Ukraine, three qualification categories are established – second, first, and highest, which correspond to the progressive levels of professional training, experience, and responsibility. The possession of the highest qualification category indicates the highest level of professional mastery and serves as a criterion of a physician's professional excellence.

Number of e-prescriptions issued per day

The results reveal substantial variation in the number of e-prescriptions issued daily by physicians of different specialties (Table 2). Among general practitioners and family doctors, the majority (22 respondents) reported issuing 6 to 9 e-prescriptions per day. Ten physicians issued 10 to 19 e-prescriptions, while two reported issuing more than 20 e-prescriptions daily. These findings highlight active use of e-prescriptions among physicians working in primary care settings.

In contrast, specialists in other fields tend to issue fewer e-prescriptions per day. Most commonly, they issued between 1 and 5 e-prescriptions (15 respondents), and only two reported issuing 6 to 9 e-prescriptions. Notably, 12 specialists did not issue any e-prescriptions at all, suggesting limited use of the electronic prescribing system in specialty care, likely due to the consultative nature of their work.

Only three physicians reported issuing more than 20 e-prescriptions per day. Among them were two general practitioners (therapists) - one working in an urban area and the other in a rural healthcare facility - who mainly prescribed cardiovascular medicines, and one endocrinologist from a semi-urban area, who primarily prescribed insulin preparations. The high number of e-prescriptions in their practice was driven by the need for continuous pharmacological management of chronic diseases and regular prescription renewals.

Analysis of e-prescriptions for antibiotics indicates cautious use of this drug class among family physicians. The majority of general practitioners and family doctors (33 respondents) issued 1 to 5 antibiotic e-prescriptions per day, while 23 reported not prescribing antibiotics via e-prescription at all. A similar trend was observed among other specialists: 14 issued 1 to 5 antibiotic e-prescriptions daily, while 16 reported not issuing any.

Overall, the study found significant differences in the volume of e-prescriptions between general practitioners and other specialists. For total medications prescribed, a statistically significant difference was observed ($\chi^2 = 25,77$; $p < 0,0001$), confirming the leading role of family doctors in the adoption of e-prescriptions as part of primary healthcare delivery.

In contrast, no statistically significant difference was observed in the e-prescription of antibiotics ($\chi^2 = 0,74$; $p = 0,389$) compared to other medications, indicating a uniform approach to antibiotic prescribing across all specialties. This finding is important in the context of promoting rational antibiotic use and adherence to unified standards of antimicrobial therapy.

Future research could explore the underlying reasons for the more widespread use of e-prescriptions among family doctors and identify strategies to enhance the adoption of electronic prescribing systems among specialists.

E-Prescriptions Issued Remotely

The results of the study reveal significant differences in the use of remote e-prescribing functionality among physicians of different specialties (Table 3). General practitioners and family doctors were substantially more likely to issue e-prescriptions remotely (82,1 %) compared to specialists (26,7%). The chi-square test confirmed a statistically

Tab. 2. *Frequency of e-prescription issuance*

E-prescriptions per day	General practitioners and family doctors				Other specialties			
	All drugs		Antibiotics		All drugs		Antibiotics	
	n	%	n	%	n	%	n	%
20 or more	2	3,57	-	-	1	3,33	-	-
10–19	10	17,86	-	-	-	-	-	-
6–9	22	39,29	-	-	2	6,67	-	-
1–5	18	32,14	33	58,93	15	50,0	14	46,67
Do not prescribe	4	7,14	23	41,07	12	40,0	16	53,33
Total	56	100	56	100	30	100	30	100

Tab. 3. *Use of remote e-prescriptions by physicians*

	Family Doctors (General Practice and Family Medicine)		Physicians of Other Specialties	
	Prescribe Remotely	Do Not Prescribe Remotely	Prescribe Remotely	Do Not Prescribe Remotely
	n (%)	n (%)	n (%)	n (%)
Region				
Rivne Oblast	35 (62,5)	3 (5,4)	8 (26,7)	20 (66,7)
Ivano-Frankivsk Oblast	11 (19,6)	4 (7,1)	-	-
Poltava Oblast	-	3 (5,4)	-	1 (3,3)
Vinnytsia Oblast	-	-	-	1 (3,3)
Location				
Rural area	20 (83,3)	4 (16,7)	1(50,0)	1 (50,0)
Town	8 (100)	-	1 (10,0)	9 (90,0)
City	18 (75,0)	6 (25,0)	6 (33,0)	12 (66,7)

significant association between medical specialty and the use of remote prescribing ($\chi^2 = 23,4$, $p < 0,001$). This may reflect the organizational features of primary healthcare and the closer, ongoing relationships family doctors tend to have with their patients. In contrast, specialists may be limited in their use of this feature due to the complexity of clinical cases that often require in-person evaluation.

Analysis by type of locality also demonstrates considerable variation in remote prescribing practices. In rural areas, 83 % of family doctors (20 out of 24) reported issuing e-prescriptions remotely. However, only two specialists participated from rural areas, one of whom used remote prescribing, limiting the ability to conduct meaningful statistical comparisons for this subgroup.

In urban-type settlements (small towns), remote prescribing was reported by 100% of family doctors (8 out of 8), suggesting efficient use of digital tools for managing chronic conditions and repeat prescriptions. On the other hand, 90 % of specialists in small towns did not utilize remote prescribing, indicating a minimal uptake in this group.

In urban settings, 75,0 % of family doctors (18 out of 24) reported using remote prescribing, compared to 33,3 % of specialists (6 out of 18). These data underscore the greater integration of e-prescription systems into the workflows of primary care physicians.

Impact of E-Prescriptions on Physicians' Workflow

The collected data (Tab. 4) indicate that in most cases (50.0 %), the process of issuing an e-prescription takes between 3 to 5 minutes. This suggests that while e-prescriptions can serve as a relatively quick tool for medication prescribing, they still require time for technical and administrative procedures.

A total of 23,2 % of physicians reported spending 1 to 2 minutes on issuing an e-prescription, reflecting efficient use of the electronic system. Meanwhile, 17 % of respondents indicated that the process takes more than 6 minutes, which may be due to technical issues or individual difficulties in using software and computer equipment. Additionally, 9,8 % of physicians stated that the procedure takes less than one minute, likely a result of well-organized workflows and sufficient digital literacy among staff.

It should be noted that the process of issuing a prescription, even under normal conditions, takes at least five minutes, which constitutes a significant portion (approximately one third) of the standard outpatient appointment time that usually does not exceed fifteen minutes. Under the conditions of limited resource availability in primary healthcare, especially during the period of martial law, this creates an additional workload for physicians.

Overall, these results demonstrate that the integration of e-prescriptions into clinical practice has the potential to reduce the time required for medication prescribing and dispensing. However, further research is needed to identify the causes of delays and to propose strategies for improving system performance and usability.

Tab. 4. *Time required to issue an e-prescription*

Time Required to Issue an E-Prescription	n	%
< 1 minute	8	9,8
1–2 minutes	19	23,2
3–5 minutes	41	50,0
6–10 minutes	14	17,0
Total	82	100

Overall Evaluation of E-Prescription as a Working Tool

Analysis of the survey results indicates a generally positive perception of e-prescription implementation and a fairly high evaluation of this digital innovation (Tab. 5). The highest mean score (4.39 ± 0,78) was given to the statement „*The e-prescription is useful in my work*," with

Tab. 5. *Attitudes Toward E-Prescription*

Statement	Strongly disagree (1)	Disagree (2) n (%)	No opinion (3) n (%)	Somewhat agree (4) n (%)	Strongly agree (5) n (%)	Mean ± SD
E-prescription is useful in my work	0	3(3,7)	6 (7,3)	29 (35,4)	44 (53,7)	4,39 ± 0,78
E-prescription facilitates my work	1 (1,2)	7 (8,5)	8 (9,8)	30 (36,6)	36 (43,9)	4,13 ± 0,98
E-prescription makes my work more efficient	2 (2,4)	7 (8,5)	9 (11,0)	33 (40,2)	31 (37,8)	4,02 ± 1,02
E-prescription allows me to work faster	3 (3,7)	13 (15,9)	7 (8,5)	28 (34,1)	31 (37,8)	3,87 ± 1,19

a corresponding 95 % confidence interval [4,22–4,56], reflecting strong and statistically stable support from physicians.

Other aspects, such as work facilitation, efficiency, and speed, were also rated above 3,8, allowing us to conclude a generalized acceptance of e-prescription use among physicians. In particular, the statement *„The e-prescription facilitates my work"* had a mean score of 4,13 (95 % CI: [3,91–4,35]), and *„The e-prescription allows me to work faster"* scored 3,87 (95 % CI: [3,61–4,13]). These results still demonstrate a clearly positive dynamic, albeit with slightly more variability in responses (SD = 1,19).

The differences in average scores and the widths of confidence intervals suggest that physicians interpret the functional benefits of e-prescriptions in different ways: while the overall usefulness has become an accepted norm, issues related to workflow speed may require further optimization (e. g., system interface, tech support, rural connectivity).

None of the statements were rated critically by respondents, which reflects the absence of rejection or resistance toward e-prescriptions among the medical community. These findings indicate that the e-prescription has already passed the acceptance stage, and further efforts should focus on technological refinement and enhancing physicians' digital competence.

Discussion

Electronic prescribing has the potential to improve physicians' efficiency and enhance the quality of care. Our findings support this premise: 82,1 % of general practitioners reported using the remote e-prescription function, compared with only 26,7 % of specialists ($\chi^2 = 23{,}4$; $p < 0{,}001$). A similar pattern was observed in Poland, where family physicians readily accepted the mandatory e-prescribing system, despite concerns about its impact on individual efficiency. Wrzosek et al. (2020) showed that Polish general practitioners had fully integrated e-prescriptions into daily practice as early as the 2020 roll-out, even though technical challenges and scepticism over digital workflows persisted [5].

Polish doctors also noted that, during the transition period, issuing an e-prescription took roughly 29 seconds longer than writing a paper script [5]. In our Ukrainian sample the mean time was 3–5 minutes (reported by 50 % of respondents), highlighting areas for improvement – both in software optimisation and in physician adaptation to digital tools. Country-specific differences in processing speed are likely driven by the type of information system in use, the availability of technical support, the level of digital literacy, and internet connectivity.

Comparable results were reported in Greece. In a survey of > 430 prescribers, Grammatikopoulou et al. (2024) found that most users rated the e-prescription platform easy to use, yet called for richer information on adverse reactions, drug interactions, allergies and integration with treatment protocols [6]. This mirrors our data: physicians rated the overall usefulness of e-prescribing highly (mean 4,39 ± 0,78), but scored items linked to efficiency and speed slightly lower (e. g., *„allows me to work faster"* = 3,87 ± 1,19).

In Norway, Lundhaug et al. (2025) confirmed that national e-prescribing services enable clinicians to offload tasks to automated routines, reducing workload and increasing job satisfaction [7]. Although Ukraine's system is still maturing, these trends point to a similar reform trajectory.

Importantly, overall physician ratings in Ukraine indicate the „acceptance" stage: no statement attracted strong negativity. Thus, the issue is no longer resistance to digital technology but fine-tuning and optimisation. The speed, technical support and clinical-protocol integration problems flagged in Greek and Polish contexts remain equally relevant for Ukraine.

In summary, our study confirms a positive trajectory for e-prescription adoption in Ukraine. Compared with Poland, Greece and Norway, Ukraine shows analogous dynamics – gradual acceptance, willingness to use digital tools, and favourable attitudes among clinicians. Future efforts should focus on technical refinement, boosting digital competence, and tailoring solutions to the needs of both primary-care and specialist physicians.

Conclusions

- General practitioners and family physicians use e-prescriptions more actively than specialists: a statistically significant difference was observed in the overall volume of e-prescriptions issued ($\chi^2 = 25{,}77$; $p < 0{,}0001$), highlighting the leading role of primary care in the digitalisation of medication prescribing.
- The use of e-prescriptions for antibiotics does not depend on the physician's specialty: both groups showed a similar pattern in prescribing antibiotics – 58,9 % of GPs and 46,7 % of specialists issue 1–5 antibiotic e-prescriptions daily, while 41,1 % and 53,3 % respectively do not prescribe them at all.
- E-prescriptions are generally evaluated by physicians as a convenient and useful tool, though optimisation is needed: the highest score was assigned to the statement *„the e-prescription is useful in my work"* (mean = 4,39 ± 0,78; 95 % CI: 4,22–4,56). However, 17 % of respondents reported spending more than 6 minutes issuing a prescription.

***Funding**: This research received no external funding.*

***Conflicts of Interest**: The authors declare no conflict of interest.*

***Acknowledgements**: The authors would like to express their gratitude to all participants of the survey.*

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