

Pharmacists' perspectives on the implementation of pharmacist prescribing in Ukraine: a nationwide survey

Oleksandr Komarida¹, Kostyantyn Kosyachenko¹, Nataliia Sakhnatska¹

¹ Department of Organization and Economics of Pharmacy, Bogomolets National Medical University, Kyiv, Ukraine

Corresponding author: Nataliia Sakhnatska (nataliya.sakhnatskaya@gmail.com)

Received 23 April 2026 ♦ Accepted 6 July 2026 ♦ Published 22 July 2026

Citation: Komarida O, Kosyachenko K, Sakhnatska N (2026) Pharmacists' perspectives on the implementation of pharmacist prescribing in Ukraine: a nationwide survey. Pharmacia 73: e196917. <https://doi.org/10.3897/pharmacia.73.e196917>

Abstract

The study aimed to assess the awareness, attitudes, and readiness of pharmaceutical professionals in Ukraine regarding the implementation of pharmacist prescribing. In 2025, a nationwide cross-sectional online survey was conducted among 1,020 pharmacists. The results showed low awareness of international prescribing models, with only 9.0% reporting sufficient knowledge. Attitudes were mixed: 13.9% supported implementation, while 61.6% expressed negative or somewhat negative views. Support correlated with the level of professional autonomy, with collaborative models preferred over independent ones. Key perceived benefits included improved access to pharmacotherapy and reduced physician workload. Major barriers identified were the lack of a clear regulatory framework, limited access to patient medical records, insufficient interprofessional collaboration, and concerns about professional liability. Additionally, 92.9% reported insufficient knowledge, and only approximately one-third were willing to undergo specialized training. Practice-based workplace training was considered most effective. Overall, the findings support phased implementation focused on collaborative models, regulatory development, and structured postgraduate education.

Keywords

healthcare system, pharmacist prescribing, pharmaceutical service, pharmacy, survey

Introduction

The global transformation of healthcare systems has led to the expansion of the professional roles of pharmacists (Hromovyk and Kremin 2020; Hala et al. 2024). Many countries are facing a shortage of physicians, a growing burden of chronic diseases, and rising patient expectations regarding access to and quality of healthcare (Sakhanda et al. 2020). According to the World Health Organization (WHO), the global shortage of the health workforce amounted to approximately 15 million health workers in 2020 and is projected to be 10 million by 2030,

necessitating optimization of the distribution of functions among medical professions and the expansion of their professional roles (Global strategy on human resources for health: workforce 2030, World Health Organization 2022). Given the above trends, the involvement of pharmacists in the prescribing process is now considered a global trend. In many countries, pharmacists are allowed to prescribe medicines or adjust existing prescriptions, depending on the pharmacist prescribing model. Internationally, two basic models of pharmacist prescribing are typically distinguished: dependent and independent (Famiyeh and McCarthy 2017; Mesbahi et al. 2025). Both

models involve the pharmacist assessing the patient's condition, justifying the choice of pharmacotherapy, and planning further treatment; however, the dependent model of prescribing is implemented under the supervision of a physician within an established interprofessional collaboration framework.

In different countries, these models may have various modifications and hybrid forms, reflecting differences in national legislation, the level of professional autonomy of pharmacists, and healthcare system organization. In the United States of America (USA), pharmacist prescribing authority is structured along a continuum of four models: joint prescribing of medicines for a specific patient in collaboration with a physician; prescribing for specific groups of patients under such agreements; prescribing in accordance with clinical protocols approved at the state level; and independent prescribing of medicines from certain therapeutic groups within the framework of the legally defined scope of practice (Sachdev et al. 2020).

Across Europe, pharmacist prescribing remains heterogeneous and is implemented through different national models. A recent scoping review identified independent pharmacist prescribing in community pharmacy in several countries, including the United Kingdom, Poland, Switzerland, and Denmark (Mesbahi et al. 2025). In addition, more restricted or protocol-based models have recently been introduced in other European countries. For example, Ireland's Common Conditions Service enables trained community pharmacists to prescribe selected prescription-only medicines for seven common conditions in accordance with national clinical protocols (Ali et al. 2026), while in France, pharmacists may supply selected antibiotics without a physician's prescription for confirmed tonsillitis or uncomplicated cystitis under defined diagnostic and training requirements (Ministry of Health and Prevention of France 2024). Therefore, pharmacist prescribing in Europe should be understood as a continuum of models, ranging from prescription renewal and protocol-based supply to restricted or independent prescribing.

International studies suggest that the implementation of pharmacist prescribing is associated with improved clinical outcomes, increased access to pharmacotherapy, and enhanced healthcare system efficiency. In the USA, a cost-effectiveness analysis using a Markov model found that managing 50% of patients with hypertension through pharmacist prescribing would save \$10,162 per person over a 30-year period, resulting in total savings of \$1.13 trillion at the population level (Dixon et al. 2023). Evidence from Australia also supports the effectiveness of pharmacist involvement in prescribing within collaborative care models. A study conducted in emergency departments found that implementing a collaborative prescribing model significantly improved the safety and accuracy of medication management. An analysis of patient records revealed fewer errors and discrepancies in prescribing compared to the standard model. In addition, improvements were observed in the documentation of adverse drug reactions (Ogilvie et al. 2022).

Given the demonstrated benefits and positive international experience, it is important to assess the feasibility of implementing pharmacist prescribing in Ukraine. Despite pharmacists' involvement in patient counseling, pharmacovigilance, and vaccination, the right to prescribe prescription medicines in Ukraine is currently limited to physicians. Ukraine is undergoing large-scale healthcare reforms and is actively aligning its national legislation with European Union (EU) standards following the acquisition of EU candidate status. A key regulatory milestone was the adoption of the Law of Ukraine "On Medicinal Products" No. 2469-IX of 28 July 2022 (Verkhovna Rada of Ukraine 2022), which provides for the introduction of a comprehensive pharmaceutical service in pharmacies from 2027 as a distinct professional activity.

This reform should be considered within the broader regulatory framework governing pharmacy practice in Ukraine. The operation of pharmacies and pharmacy chains is based on a licensing model, under which retail trade in medicines may be carried out only by licensed business entities through pharmacies and their structural subdivisions. Licensing conditions establish requirements for pharmacy premises, equipment, storage and quality assurance of medicines, documentation, provision of information to consumers, and the qualifications of pharmaceutical personnel (Cabinet of Ministers of Ukraine 2016). Pharmacy chains operate under the same regulatory framework; therefore, each pharmacy or structural subdivision must comply with the established licensing requirements. This context is particularly relevant to pharmacist prescribing, as any expansion of pharmacists' scope of practice would need to be integrated into the existing system of licensing, staffing, quality assurance, and professional liability.

In addition to legal and regulatory prerequisites, the need to implement pharmacist prescribing is driven by a range of sociopolitical factors. Particularly important among these factors are the impact of martial law, the shortage of the health workforce, the destruction of medical infrastructure, and the population's uneven access to medical care, particularly in rural areas and in areas affected by hostilities (Shmalko 2022). Under such conditions, expanding the role of pharmacists can serve as a key mechanism to improve the access, continuity, and quality of care, ensuring that patients receive the necessary support even with limited access to a physician. Against this background, it is of particular importance to assess the perspectives of Ukrainian pharmacists on the feasibility and appropriateness of implementing pharmacist prescribing within the national healthcare system.

Therefore, the aim of the study was to assess the level of awareness, attitudes, and readiness of Ukrainian pharmacists to implement pharmacist prescribing in the context of European integration and international experience. Understanding the perspectives of pharmacists is essential for informing health policy, developing educational programs, and establishing an appropriate regulatory framework for expanding pharmacists' scope of practice.

To achieve the study aim, the following objectives were defined:

- To assess pharmacists' awareness of international pharmacist prescribing models;
- To evaluate their attitudes toward the implementation of pharmacist prescribing in Ukraine and to identify perceived benefits, risks, and barriers;
- To identify factors influencing pharmacists' willingness to engage in prescribing activities;
- To develop recommendations for the potential implementation of this practice in Ukraine based on international experience.

Materials and methods

Sample justification

This study employed a quantitative cross-sectional design using a non-probability convenience sampling approach (Ahmed 2024). Data were collected through an online questionnaire distributed via professional networks and social media platforms targeting pharmacists in Ukraine. Although this sampling method does not ensure full representativeness, the large sample size provides valuable insights into pharmacists' perspectives on the potential implementation of pharmacist prescribing.

The target population comprised approximately 28,000 pharmacists working in community pharmacies in Ukraine. The required sample size was estimated using a standard formula for proportion-based surveys:

$$n = P \times (1 - P) \times z^2 / d^2,$$

where P is the expected proportion (set at 50% to ensure maximum variability), z corresponds to the standard normal distribution value for a 95% confidence level ($z = 1.96$), and d is the margin of error (5%). The value of 50% was chosen as it provides the most conservative (maximum) sample size estimate. Based on these parameters, the minimum recommended sample size was 379 participants. The required sample size was estimated using a standard formula for proportion-based surveys and verified using the Raosoft sample size calculator (Anon Free Raosoft Sample Size Calculator 2026). The final sample included 1,020 pharmacists, substantially exceeding the minimum requirement. Given the population size ($n = 28,000$) and the achieved sample ($n = 1,020$), the estimated sampling error is approximately 3.0%, indicating acceptable precision of the survey estimates.

Participants' eligibility criteria

Inclusion criteria for participation in the study were (a) holding a pharmaceutical degree (Bachelor's or Master's level) and (b) current employment in a community pharmacy. Hospital pharmacies were not included in the target population, as the study focused on patient-facing practice

in the community pharmacy setting. The inclusion criteria were clearly stated on the introductory page of the questionnaire. Compliance with these criteria was assessed using mandatory self-report screening questions at the beginning of the questionnaire, including questions on respondents' pharmaceutical education, current position, and practice setting. Only respondents who met the eligibility criteria were included in the final analysis. Because of the anonymous online design of the survey, documentary verification of education or employment status was not possible.

In the Ukrainian national context, pharmaceutical education is structured across several levels. Colleges and professional pre-higher education institutions train professional junior bachelors, who may work as assistant pharmacists, whereas universities and faculties of pharmacy provide Master's-level training in the specialty "Pharmacy, Industrial Pharmacy," corresponding to complete higher pharmaceutical education. The Master's level usually involves approximately 5 years of study and develops the competencies required to perform the professional functions of a pharmacist with a higher degree of professional autonomy and responsibility. After graduation, pharmacists' professional development continues through internships, specialization, and continuing professional development.

Respondents with Bachelor's-level education were included because they constitute part of real-world community pharmacy practice in Ukraine and may be involved in dispensing medicines and providing information on their use. However, their level of professional autonomy is lower than that of pharmacists with a Master's degree. Therefore, they were included not as potential independent pharmacist prescribers, but as part of the pharmacy workforce whose workflow may be affected by the potential implementation of pharmacist prescribing. At the same time, if pharmacist prescribing is introduced in Ukraine, the potential right to prescribe should primarily be considered for pharmacists with a Master's degree and appropriate postgraduate training.

Data collection

The survey was conducted using a Google Forms questionnaire from April to June 2025. Pharmacists who met the inclusion criteria were invited to participate in the study via direct distribution through pharmacies and through professional communities on social media platforms, in particular specialized Facebook groups that unite Ukrainian pharmacists. Data were analyzed using Microsoft Excel (Microsoft Corporation, USA), and the results are presented in tables and diagrams.

Participant characteristics

The sample was predominantly female (98.2%), reflecting the high proportion of women in Ukraine's pharmaceutical workforce. The regional distribution of respondents showed a predominance of participants from Western Ukraine (72.4%), likely reflecting the impact of martial law and re-

lated internal migration processes. Since 2022, the western regions of Ukraine have become key centers of relocation of enterprises, healthcare facilities, and pharmacies, as well as areas with a high concentration of the pharmaceutical workforce. This has affected the territorial structure of the sample and reflects the current socioeconomic realities of the pharmaceutical sector in wartime conditions.

The age distribution showed that 61.2% of respondents were aged 26–44 years. These results indicate that the sample mainly reflects the views of professionals in the active stage of their careers with relevant practical experience in pharmacy.

The majority of respondents worked in large pharmacy chains (72.3%), which allows the results to be interpreted in terms of large-scale pharmacy operations, including the implementation of corporate standards and standardized approaches to pharmacy practice.

A detailed distribution of the demographic characteristics of the respondents is presented in Table 1.

Table 1. Respondents' characteristics.

Characteristic	Respondents (%)
Sex	Male – 1.8%
	Female – 98.2%
Age	Up to 25 – 13.9%
	26–34 – 29.7%
	35–44 – 31.5%
	45–54 – 14.2%
	Above 55 – 0.7%
Position	Pharmacist's assistant – 39.3%
	Pharmacist – 20.5%
	Head of a pharmacy – 36.5%
	Other – 3.5%
Education	Intermediate special (college) – 44.1%
	Higher education – 52.2%
	Higher education in progress – 3.4%
Work experience	Up to 1 – 3.4%
	1–5 – 15.2%
	6–10 – 20.1%
	11–15 – 20.3%
	Above 15 – 41%
Size of pharmacy network	Single pharmacy – 0.4%
	Small pharmacy chain (1–10 outlets) – 2.9%
	Medium pharmacy chain (11–50 outlets) – 5.6%
	Big pharmacy chain (51–100 outlets) – 18.8%
	Large pharmacy chain (over 100 outlets) – 72.3%
Region of operation in Ukraine	Kyiv – 4.7%
	Western – 72.4%
	Eastern – 2.1%
	South – 3.3%
	North – 5.1%
	Central Ukraine – 12.4%

Study design

The questionnaire consisted of three main sections. The introductory section outlined the aims, procedures, and participation conditions. The first section collected re-

spondents' demographic characteristics, including age, gender, level of education, place of work, and years of professional experience. The second section focused on assessing pharmacists' attitudes toward the potential implementation of pharmacist prescribing. It examined support for different prescribing models, as well as perceived benefits, risks, and barriers to implementation in Ukraine. The third section assessed pharmacists' interest in undergoing specialized training required to engage in prescribing activities and identified priority areas for such training.

To ensure content validity, the questionnaire was reviewed by three experts in pharmacy and pharmaceutical education to eliminate ambiguous wording and ensure the scientific validity and clarity of each item. The consistency of the questionnaire items was evaluated using corrected item–total correlation (Howard and Forehand 1962). Prior to the main study, a pilot test was conducted on a sample of 50 respondents. Based on participant feedback, minor revisions were made to the questionnaire.

The research materials were the results of the questionnaire survey, scientific publications, legal and regulatory documents, and official resources from regulatory authorities related to the expansion of the role of pharmacists and pharmacist prescribing models across countries. Data were analyzed using descriptive statistical, comparative, and analytical methods, as well as data synthesis.

Ethical considerations

Participation in the study was voluntary and anonymous. Data were analyzed and reported in aggregate form in accordance with the principles of confidentiality and the ethical standards of scientific research. Ethical approval for the study was obtained from the Commission on Bioethics and Research Ethics at Bogomolets National Medical University (approval No. 189, 25 November 2024).

Results

Pharmacists' attitudes toward the implementation of pharmacist prescribing in Ukraine

Given the widespread use of this practice internationally, the first survey question assessed Ukrainian pharmaceutical professionals' awareness of pharmacist prescribing in other countries. The results showed a low level of awareness: only 9.0% of respondents were well informed about this practice, 35.6% had a limited understanding, and the majority (55.4%) were unfamiliar with it.

Based on these findings, the next stage of the study aimed to provide respondents with a basic understanding of international models of pharmacist prescribing and to assess their acceptability in the Ukrainian context. A re-

view of the literature identified four key models of pharmacist prescribing, which were used as the basis for evaluating their potential implementation in Ukraine. As part of the survey, respondents were briefly introduced to these models (Table 2), after which they were asked to provide an expert assessment of their implementation prospects in Ukraine using a five-point Likert scale (Fig. 1). To ensure clarity and avoid repetition, the models were conventionally labeled A–D.

After respondents were introduced to the main international models of pharmacist prescribing, their overall attitudes toward the implementation of this service in Ukraine were assessed. The results showed mixed attitudes among pharmacists: only 4.0% of respondents fully supported the initiative and 9.9% rather supported it, while 24.5% were undecided. A substantial proportion expressed negative attitudes, with 33.6% rather not supporting the implementation of the service and 28.0% strongly opposing it (Fig. 2).

Based on the previous stages of the study, including the analysis of international experience and the assessment of pharmacist prescribing models, the next stage focused on evaluating the expected benefits of implementing this

practice. Respondents rated the statements using a five-point Likert scale (Fig. 3).

In addition to assessing the potential benefits of pharmacist prescribing, the study also aimed to identify potential risks and barriers to its implementation. To this end, respondents were asked to rate their agreement with statements on potential challenges and limitations using a five-point Likert scale (Fig. 4).

To develop practice-oriented recommendations for the implementation of pharmacist prescribing in Ukraine, priority measures perceived as critical by respondents for its successful implementation were assessed using a five-point Likert scale (Fig. 5).

After identifying the measures necessary for the successful implementation of pharmacist prescribing in Ukraine, the next stage focused on clarifying the scope of pharmacists' potential prescribing authority. In particular, respondents were asked to indicate which medicines could be prescribed by pharmacists (Fig. 6).

Overall, the results suggest that pharmacists view the expansion of prescribing authority as a phased process, with initial involvement in prescribing lower-risk medicines with clearly defined indications.

Table 2. Models of pharmacist prescribing and their characteristics.

Model	Characteristics
Model A. Collaborative prescribing (dependent)	Pharmacists prescribe medications under collaborative agreements with physicians. This model involves regular interaction between pharmacists and general practitioners, with prescribing guided by local formularies or formalized agreements for specific patient groups.
Model B. Restricted independent prescribing	Pharmacists have the authority to prescribe medications independently, but within defined limitations. Restrictions may apply to specific patient groups, conditions, or approved medication lists. Prescribing is conducted without direct physician supervision but is regulated by established legal frameworks.
Model C. Independent prescribing for established diagnoses	Pharmacists independently prescribe medications for patients with established diagnoses. They are responsible for assessing the patient's condition and making clinical decisions, including initiating pharmacotherapy, within the scope of confirmed conditions.
Model D. Independent prescribing for diagnosed and undiagnosed conditions	Pharmacists have full authority to prescribe medications for both diagnosed and undiagnosed conditions. They independently assess patients and make clinical decisions regarding treatment. This represents the highest level of professional autonomy in prescribing practice.



Figure 1. Distribution of respondents' ratings of the implementation prospects of international models of pharmacist prescribing in Ukraine (%).

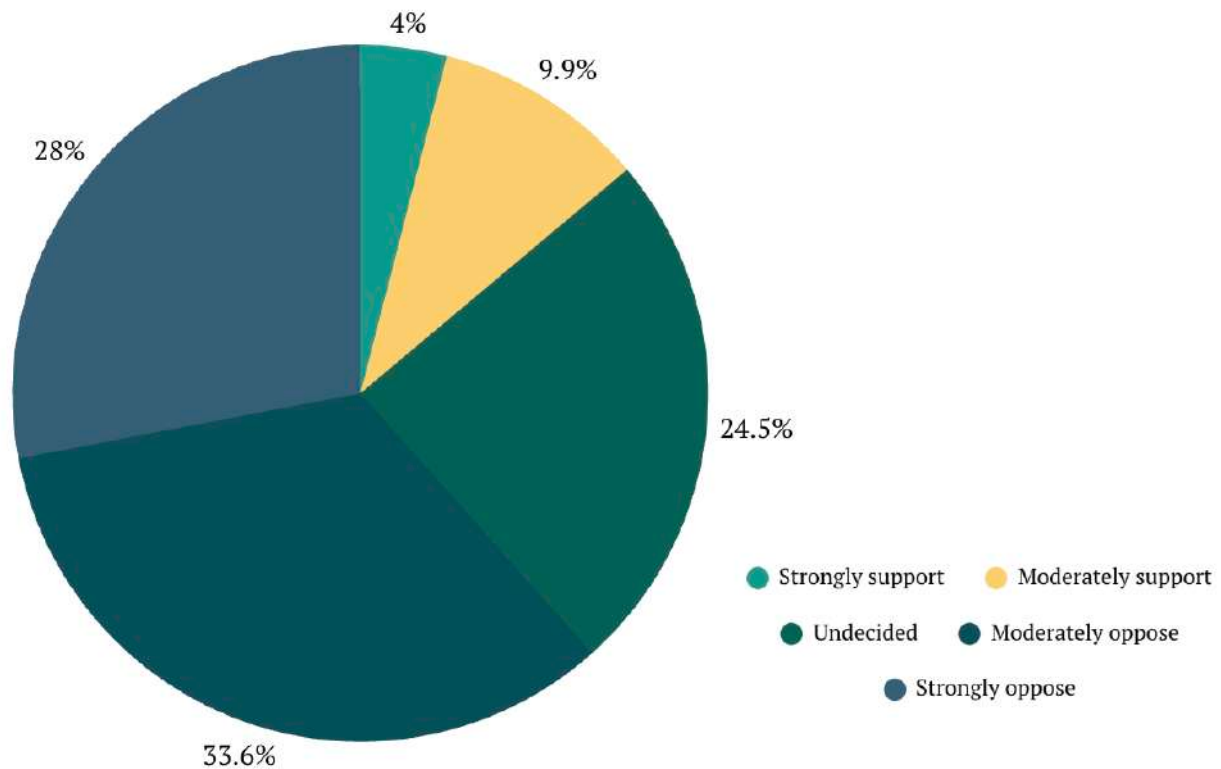


Figure 2. Distribution of Ukrainian pharmacists' attitudes toward the implementation of pharmacist prescribing.

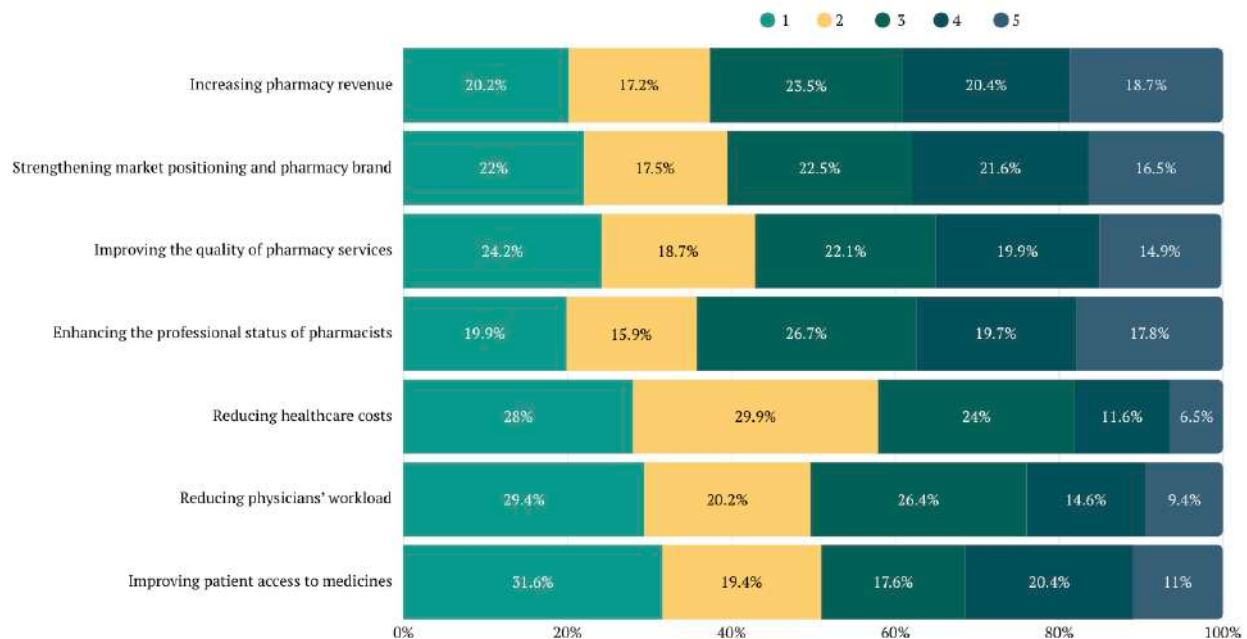


Figure 3. Pharmacists' ratings of the perceived benefits of implementing pharmacist prescribing in Ukraine (%).

Pharmacists' interest in training in pharmacist prescribing

Given the results of the assessment of the prospects for implementing pharmacist prescribing, as well as the identified benefits, risks, and potential areas for expand-

ing the professional scope of pharmaceutical specialists, the next section of the study focuses on assessing the level of pharmacists' interest in undertaking specialized training in prescribing. This is considered a key prerequisite for the effective and safe implementation of relevant changes in the national healthcare system. To

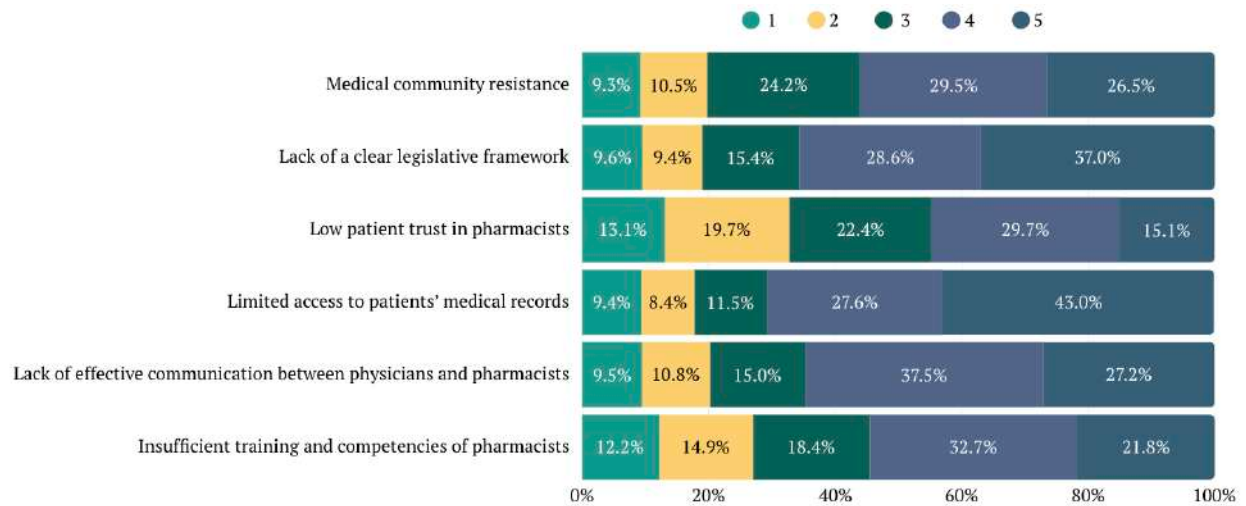


Figure 4. Pharmacists' ratings of perceived risks and barriers to pharmacist prescribing implementation in Ukraine (%).

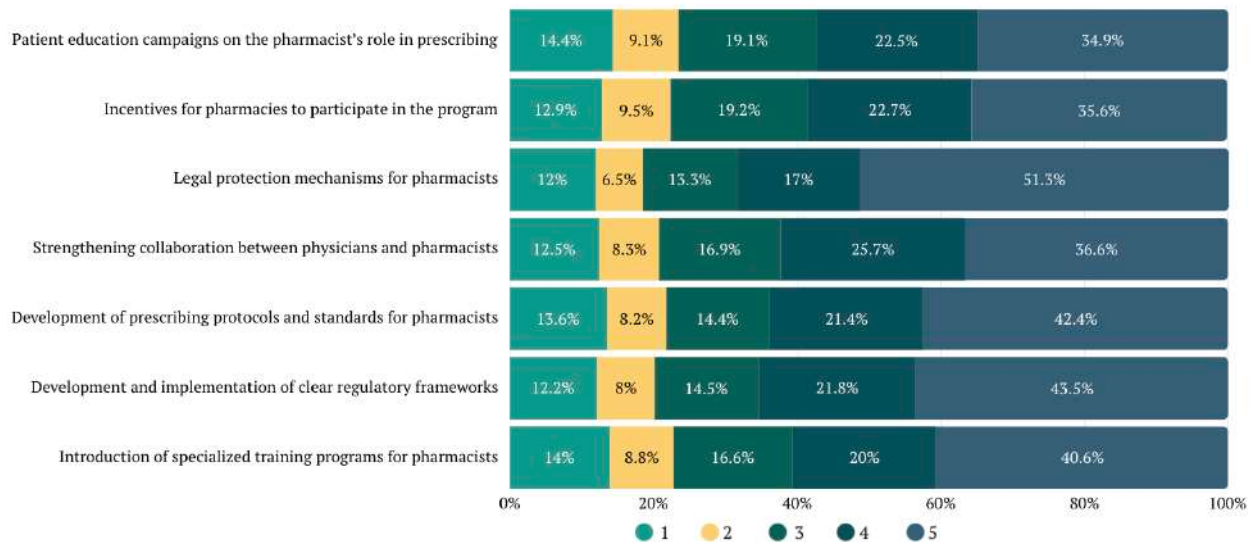


Figure 5. Pharmacists' ratings of priority measures for implementing pharmacist prescribing in Ukraine (%).

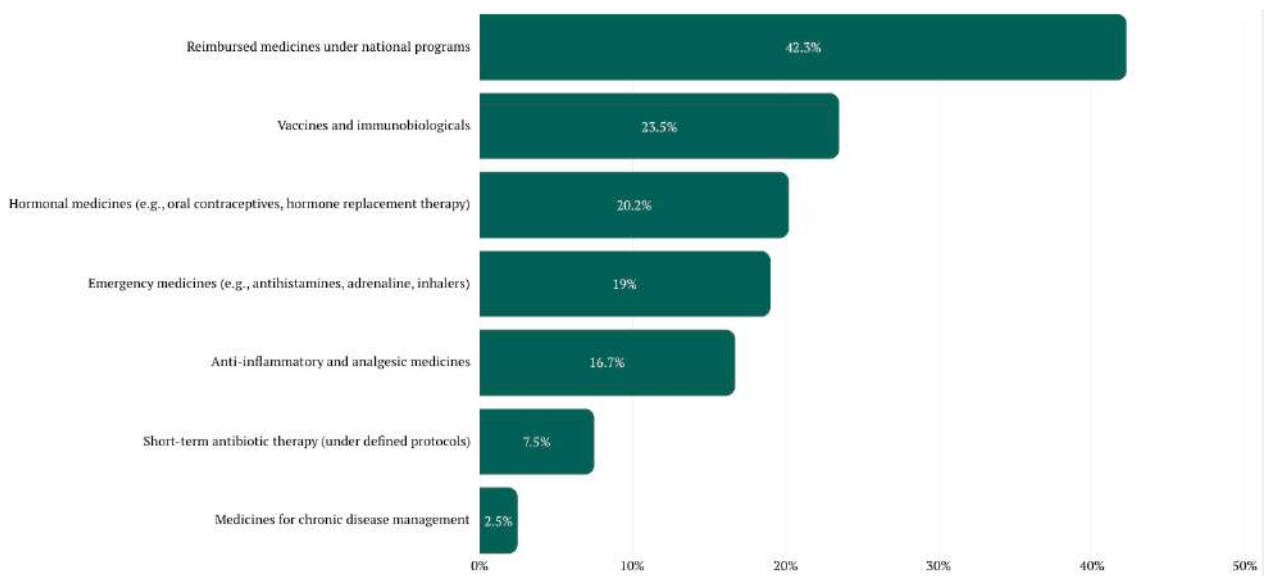


Figure 6. Pharmacists' responses on medicines eligible for pharmacist prescribing in Ukraine (multiple choice, %).

comprehensively assess the educational capacity of pharmacists to perform extended professional functions, the next question in the questionnaire aimed to determine respondents' subjective assessment of the sufficiency of the existing knowledge of pharmaceutical specialists in Ukraine for prescribing (Fig. 7).

The results indicate that only 7.1% of respondents consider the level of pharmacists' professional training to be sufficient for prescribing practice, while the vast majority (92.9%) report partial sufficiency or insufficiency of existing knowledge, thereby justifying the need for the introduction of systematic specialized training prior to

implementing this practice. To provide a more in-depth assessment of the educational readiness of pharmaceutical professionals to implement prescribing practice, the next question in the questionnaire aimed to determine their willingness to undergo specialized training to obtain appropriate professional credentials in the future.

The survey results indicate that 29.9% of respondents expressed willingness to undergo specialized training to obtain prescribing rights in the future. At the same time, 26.4% of respondents indicated a lack of such willingness, while the largest proportion (43.7%) were uncertain and selected the option "uncertain" (Fig. 8).

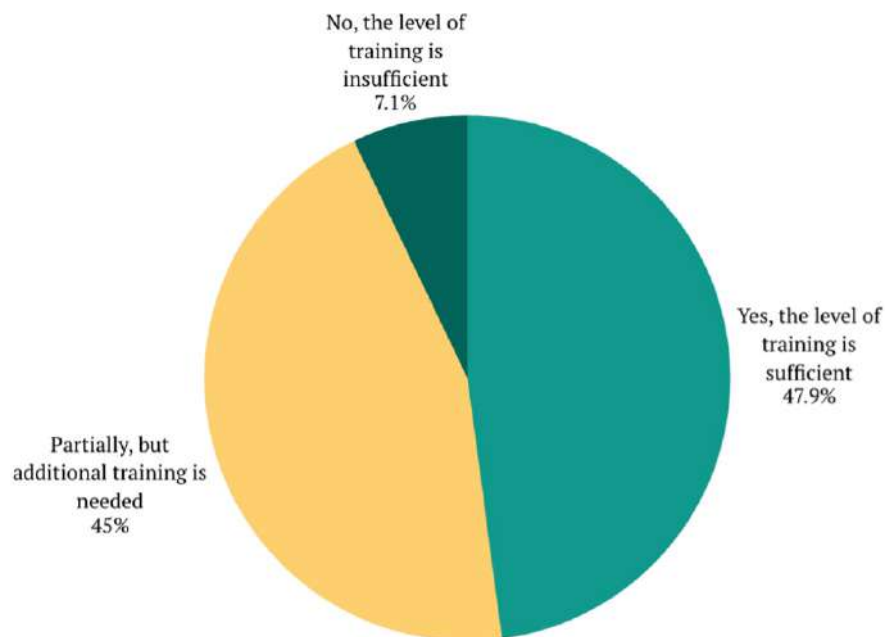


Figure 7. Respondents' assessment of the sufficiency of pharmacists' knowledge in Ukraine for prescribing practice.

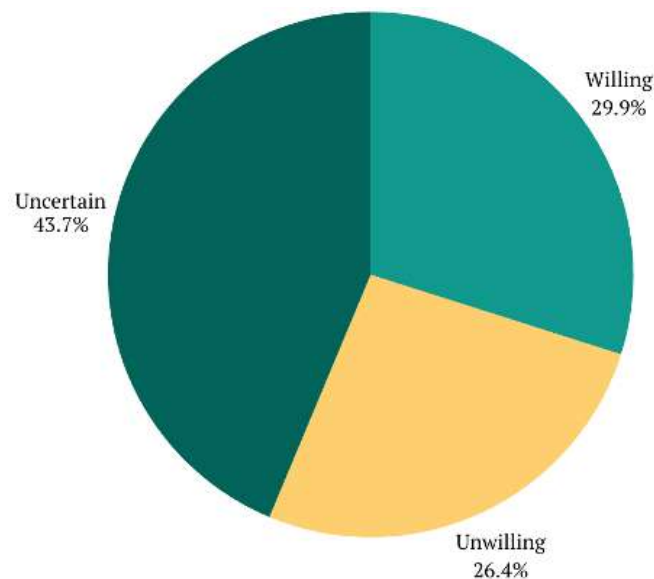


Figure 8. Pharmacists' willingness to undergo specialized training in prescribing.

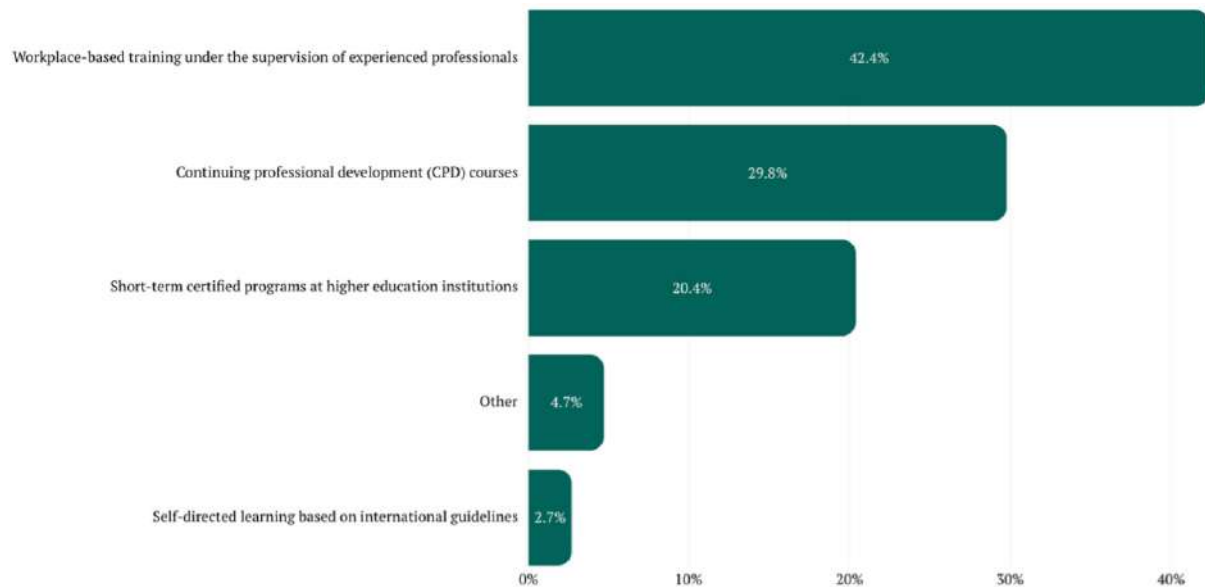


Figure 9. Preferred formats of additional professional training for pharmacist prescribing.

In this context, respondents were asked to assess which format of additional professional training they considered optimal for the implementation of pharmacist prescribing.

The majority of respondents (42.4%) identified workplace-based training under the supervision of experienced professionals as the most effective format of additional training. Meanwhile, 29.8% preferred continuing professional development (CPD) courses, and 20.4% favored short-term certificate programs offered by higher education institutions (Fig. 9).

Discussion

The low level of awareness among Ukrainian pharmacists regarding international pharmacist prescribing models may be partly explained by both the current legal status of this practice in Ukraine and the specific features of the CPD system under martial law. Pharmacist prescribing is not currently a legally established professional function in Ukraine; therefore, students do not receive specialized competency-based training aimed at preparing them to prescribe medicines. Familiarity with international models of expanded pharmacy practice may be acquired mainly through independent learning, scientific literature, professional events, or individual educational initiatives. This educational context helps explain the low level of respondents' awareness of international pharmacist prescribing models and the high proportion of respondents who considered pharmacists' existing knowledge insufficient for prescribing activities. In addition, during martial law, the certification of pharmaceutical personnel was temporarily suspended, and the validity of existing certificates was automatically extended, which limited opportunities for systematic professional knowledge updating. These regulatory conditions may have reduced pharmacists' engagement in CPD activities and

slowed the adoption of innovative professional practices (Kuznietsova et al. 2026). At the same time, the introduction of mandatory CPD point accumulation under Order No. 650 creates prerequisites for strengthening pharmacists' professional training and gradually addressing existing educational gaps (Ministry of Health of Ukraine 2025).

The findings demonstrated a clear relationship between respondents' support for pharmacist prescribing and the degree of pharmacist autonomy within each model. Independent prescribing, particularly for both diagnosed and undiagnosed conditions, received the highest proportion of negative ratings, whereas collaborative prescribing with physicians was relatively more acceptable. This indicates that Ukrainian pharmaceutical professionals are more likely to support a phased implementation of pharmacist prescribing, beginning with collaborative models and only gradually expanding professional autonomy. Such an approach is consistent with international experience, including the Slovenian collaborative pilot model and the staged development of pharmacist prescribing in the United Kingdom, where supplementary prescribing preceded independent prescribing (Tonna et al. 2007; Stuhec et al. 2025).

The cautious or negative attitude toward pharmacist prescribing may be associated with several factors, including the absence of clearly defined legal roles and responsibilities, limited awareness of international experience, and insufficient readiness of pharmaceutical education and CPD systems to develop the clinical competencies required for prescribing. Nevertheless, respondents recognized important potential benefits of pharmacist prescribing, particularly improved access to pharmacotherapy, reduced physician workload, and greater healthcare system efficiency. These findings correspond to international evidence showing that pharmacist prescribing can improve clinical outcomes, reduce hospital readmissions and adverse events, enhance treatment monitoring, and lower healthcare costs (Akintunde et al. 2026).

The main perceived barriers were legal, informational, and interprofessional. Respondents emphasized the lack of a clear regulatory framework, limited access to patients' medical information, insufficient communication between physicians and pharmacists, and concerns about professional liability. These findings are consistent with previous research identifying legal uncertainty, professional resistance, and insufficient clinical preparation as key barriers to pharmacist prescribing (Zhou et al. 2019). The effective implementation of pharmacist prescribing would also require the development of digital health infrastructure, including access to electronic health records, e-prescriptions, and integrated communication platforms, which may support safer clinical decision-making and continuity of care (Sakhnatska et al. 2023).

Respondents identified the development of legal acts, clinical protocols, prescribing standards, and a defined list of medicines eligible for pharmacist prescribing as priority implementation measures. They also emphasized the need for professional protection mechanisms in the event of legal claims or professional errors. This is particularly important because the expansion of pharmacists' clinical roles is associated with increased professional liability risks, while professional indemnity insurance may serve as a key mechanism of legal and financial protection (Kazim and Wertheimer 2014; Reiner et al. 2020).

The results also suggest that building public trust and strengthening interprofessional collaboration are essential prerequisites for pharmacist prescribing. In Ukraine, pharmacies are perceived both as healthcare institutions and as retail establishments, with price, discounts, loyalty programs, and location often influencing consumer choice. Such commercialization may weaken public perception of pharmacists as healthcare professionals and create additional challenges for expanding their clinical roles (Tkachenko et al. 2022).

The medicines that respondents considered most appropriate for pharmacist prescribing reflected a cautious and gradual approach. Preference was given to lower-risk medicines with well-established safety profiles, particularly anti-inflammatory and analgesic medicines, which is consistent with international experience of stepwise pharmacist prescribing implementation (Owczarek et al. 2023; Amador-Fernández et al. 2024). In contrast, the low level of support for prescribing vaccines, immunobiologicals, and hormonal medicines reflects awareness of higher clinical responsibility, the need for comprehensive patient assessment, and the importance of clearly delineating responsibilities between physicians and pharmacists.

The educational findings further confirm the need for structured postgraduate training before implementing

pharmacist prescribing. A total of 92.9% of respondents considered pharmacists' existing knowledge insufficient or only partially sufficient for prescribing, indicating a substantial gap between the potential expansion of professional roles and the current system of pharmaceutical education and training. Although some respondents expressed willingness to undergo specialized training, a large proportion remained uncertain, likely because of the absence of a clear regulatory framework, undefined responsibilities, and unclear practical conditions for applying new competencies.

Regarding preferred training formats, respondents most often selected workplace-based training under the supervision of experienced professionals, followed by CPD courses and short-term certificate programs offered by higher education institutions. This indicates the importance of practice-oriented training models that combine theoretical knowledge with clinical reasoning and practical readiness for expanded professional roles (Ghabour et al. 2023; Girvin et al. 2023). Therefore, the implementation of pharmacist prescribing in Ukraine would require clear educational pathways, standardized training programs, formal certification of competence, and appropriate regulatory and organizational support.

Conclusion

This study showed that Ukrainian pharmaceutical professionals have limited awareness of pharmacist prescribing and demonstrate cautious attitudes toward its implementation. Collaborative models involving physicians were more acceptable than independent prescribing, indicating that a phased approach would be most appropriate for Ukraine.

The implementation of pharmacist prescribing would require clear legal regulation, access to patient medical information, professional liability mechanisms, interprofessional communication, and structured postgraduate training. Therefore, pharmacist prescribing in Ukraine should initially be introduced through collaborative or protocol-based models, with gradual expansion based on regulatory, educational, and organizational readiness.

Acknowledgments

The authors sincerely thank all the pharmacists who took time from their busy schedules to complete the survey and provide their insights for a better future of pharmacy services.

References

- Ahmed SK (2024) How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports* 12: 100662. <https://doi.org/10.1016/j.oor.2024.100662>
- Akintunde AO, Karaxhija A, Laaksonen R (2026) Effects of pharmacist prescribing on health-related outcomes in secondary care compared with medical prescribing or no treatment: A systematic review. *Re-*

- search in Social and Administrative Pharmacy 22: 254–262. <https://doi.org/10.1016/j.sapharm.2025.11.003>
- Ali AH, Clyne B, Strawbridge JD, Moriarty F (2026) Identifying and measuring important outcomes for evaluating the impact of pharmacist prescribing in Ireland: A modified Delphi study. *Exploratory Research in Clinical and Social Pharmacy* 22: 100720. <https://doi.org/10.1016/j.rcsop.2026.100720>
- Amador-Fernández N, Botnaru I, Allemann SS, Kälin V, Berger J (2024) Clinical relevance and implementation into daily practice of pharmacist-prescribed medication for the management of minor ailments. *Frontiers in Pharmacology* 14: 1256172. <https://doi.org/10.3389/fphar.2023.1256172>
- Anon Free Raosoft Sample Size Calculator (2026) Raosoft Calculator. <https://raosoftcalculator.com/> [April 20, 2026]
- Cabinet of Ministers of Ukraine (2016) Resolution No. 929 of November 30, 2016, on approval of the Licensing Conditions for conducting economic activities related to the manufacture of medicines, wholesale and retail trade in medicines, and import of medicines, except active pharmaceutical ingredients. <https://zakon.rada.gov.ua/laws/show/929-2016-%D0%BF#Text>
- Dixon DL, Johnston K, Patterson J, Marra CA, Tsuyuki RT (2023) Cost-Effectiveness of Pharmacist Prescribing for Managing Hypertension in the United States. *JAMA Network Open* 6: e2341408. <https://doi.org/10.1001/jamanetworkopen.2023.41408>
- Famiyeh I-M, McCarthy L (2017) Pharmacist prescribing: A scoping review about the views and experiences of patients and the public. *Research in Social and Administrative Pharmacy* 13: 1–16. <https://doi.org/10.1016/j.sapharm.2016.01.002>
- Ghabour M, Morris C, Wilby KJ, Smith AJ (2023) Pharmacist prescribing training models in the United Kingdom, Australia, and Canada: Snapshot survey. *Pharmacy Education* 23: 100–108. <https://doi.org/10.46542/pe.2023.231.100108>
- Grivin B, Sims L, Haughey S (2023) Empowering future pharmacists - Embedding prescribing in the United Kingdom pharmacy undergraduate degree. *Currents in Pharmacy Teaching and Learning* 15: 334–339. <https://doi.org/10.1016/j.cptl.2023.04.010>
- Hala LO, Kosyachenko KL, Polova ZhM, Konoshevych LV (2024) The growing role of pharmacists in society and prospects for their professional activities. *News of Pharmacy* 108: 3–9. <https://doi.org/10.24959/nphj.24.152>
- Howard KI, Forehand GA (1962) A Method for Correcting Item-Total Correlations for the Effect of Relevant Item Inclusion. *Educational and Psychological Measurement* 22: 731–735. <https://doi.org/10.1177/001316446202200407>
- Hromovyyk BP, Kremin YuI (2020) Features of pharmacists professional roles realization in the Ukrainian realities. *Management, Economy and Quality Assurance in Pharmacy* 0: 42–49. <https://doi.org/10.24959/uekj.20.9>
- Kazim S, Wertheimer A (2014) The Emerging Importance of Professional Liability Insurance Coverage for Pharmacists. *Pharmacology & Pharmacy* 05: 171–174. <https://doi.org/10.4236/pp.2014.52023>
- Kuznietsova VYu, Zarichkova MV, Mishyna IYu, Dolzhnikova OM, Adonkina VYu (2026) Analysis of the level of awareness and attitude of pharmacy assistants to the continuous professional development in Ukraine. *Social Pharmacy in Health Care* 11: 25–36. <https://doi.org/10.24959/sphhcj.25.371>
- Mesbahi Z, Piquer-Martinez C, Benrimoj SI, Martinez-Martinez F, Amador-Fernandez N, Zarzuelo MJ, Dineen-Griffin S, Garcia-Cardenas V (2025) Pharmacists as independent prescribers in community pharmacy: A scoping review. *Research in Social and Administrative Pharmacy* 21: 142–153. <https://doi.org/10.1016/j.sapharm.2024.12.008>
- Ministry of Health and Prevention of France (2024) Order of June 17, 2024 setting out the conditions for dispensing medicines without a prescription after a rapid diagnostic orientation test, the specific training requirements for community pharmacists, and the conditions for conditional dispensing prescriptions. <https://www.legifrance.gouv.fr/jorf/id/JORFSCATA000049734414>
- Ministry of Health of Ukraine (2025) Order No. 650 of April 16, 2025 on approval of the procedure for certification of healthcare workers and amendments to certain orders of the Ministry of Health of Ukraine. <https://moz.gov.ua/uk/decrees/nakaz-moz-ukrayini-vid-16-04-2025-650> [April 20, 2026]
- Ogilvie M, Nissen L, Kyle G, Hale A (2022) An evaluation of a collaborative pharmacist prescribing model compared to the usual medical prescribing model in the emergency department. *Research in Social and Administrative Pharmacy* 18: 3744–3750. <https://doi.org/10.1016/j.sapharm.2022.05.005>
- Owczarek A, Marciniak DM, Jezior R, Karolewicz B (2023) Assessment of the Prescribing Pharmacist's Role in Supporting Access to Prescription-Only Medicines—Metadata Analysis in Poland. *Healthcare* 11: 3106. <https://doi.org/10.3390/healthcare11243106>
- Reiner G, Pierce SL, Flynn J (2020) Wrong drug and wrong dose dispensing errors identified in pharmacist professional liability claims. *Journal of the American Pharmacists Association* 60: e50–e56. <https://doi.org/10.1016/j.japh.2020.02.027>
- Sachdev G, Kliethermes MA, Vernon V, Leal S, Crabtree G (2020) Current status of prescriptive authority by pharmacists in the United States. *JACCP: Journal of the American College of Clinical Pharmacy* 3: 807–817. <https://doi.org/10.1002/jac5.1245>
- Sakhanda IV, Skrypnyk RL, Kosyachenko KL, Davtian LL, Welchinska OV, Kabachna AV, Kosyachenko NM (2020) The method of forecasting as an Important stage in solving the problems facing health in the field of medical care of the population. *Wiadomości Lekarskie* 73: 2507–2511. <https://doi.org/10.36740/WLek202011131>
- Sakhnatska N, Alikerperova N, Kosyachenko K, Kostenko A (2023) The application of digital tools in Ukrainian pharmacies within holistic marketing. *Pharmacia* 70: 625–633. <https://doi.org/10.3897/pharmacia.70.e108555>
- Shmalko O (2022) Features of providing the population with medicines during emergencies and martial law: Analysis and prospects. *Bulletin of Social Hygiene and Health Protection Organization of Ukraine* 1(91): 35–39. <https://doi.org/10.11603/1681-2786.2022.1.13073>
- Stuhec M, Kovacic A, Korpar M, Banovic Koscak A, Koder B, Mahoric D, Bernik Golubic S, Homar V, Stepanovic A, Rotar Pavlic D, Gorup Cedilnik E (2025) Pharmacist prescriber implementation in the experiences of general practitioners, pharmacist prescribers and patients: qualitative study based on pilot trial in Slovenia. *Frontiers in Pharmacology* 16: 1712595. <https://doi.org/10.3389/fphar.2025.1712595>
- Tkachenko N, Ryzhov O, Chervonenko N, Demchenko V, Demchenko V (2022) Comparative analysis of Ukrainian and Polish consumers' attitudes to pharmacies and preferences regarding their choice. *Azerbaijan Pharmaceutical & Pharmacotherapy Journal* 22(1): 35–41. <https://doi.org/10.28942/appj.vXXIIi1y2022.156>
- Tonna AP, Stewart D, West B, McCaig D (2007) Pharmacist prescribing in the UK – a literature review of current practice and research. *Journal of Clinical Pharmacy and Therapeutics* 32: 545–556. <https://doi.org/10.1111/j.1365-2710.2007.00867.x>

World Health Organization (2022) Global strategy on human resources for health: Workforce 2030. https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_15-en.pdf [April 20, 2026]

Zhou M, Desborough J, Parkinson A, Douglas K, McDonald D, Boom K (2019) Barriers to pharmacist prescribing: a scoping review com-

paring the UK, New Zealand, Canadian and Australian experiences. *International Journal of Pharmacy Practice* 27: 479–489. <https://doi.org/10.1111/ijpp.12557>

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statements

The authors declared that no clinical trials were used in the present study.

The authors declared that no experiments on humans or human tissues were performed for the present study.

The authors declared that no informed consent was obtained from the humans, donors or donors' representatives participating in the study.

The authors declared that no experiments on animals were performed for the present study.

The authors declared that no commercially available immortalised human and animal cell lines were used in the present study.

Artificial Intelligence (AI) use

The authors accept full responsibility for the content of the manuscript, including the disclosure of any use of AI.

The following AI tools were used in the preparation of this manuscript:

AI tools: GPT.

Used for: Language, style and writing.

Description: AI tools were used to improve the linguistic quality and clarity of the manuscript.

Funding

The authors declare that no funding sources were used for writing the present article.

Author contributions

Oleksandr Komarida – conceptualization, methodology, data collection, writing – original draft. Kostyantyn Kosyachenko – supervision, conceptualization, validation, writing – review & editing. Nataliia Sakhnatska – methodology, visualization, writing – review & editing, submission and administration.

Author ORCIDs

O. Komarida  <https://orcid.org/0000-0001-6375-5732>

K. Kosyachenko  <https://orcid.org/0000-0002-0472-2196>

N. Sakhnatska  <https://orcid.org/0000-0003-4693-4717>

Data availability

All of the data that support the findings of this study are available in the main text or Supplementary Information.

Supplementary material 1

Questionnaire: Pharmacists' perspectives on pharmacist prescribing in Ukraine

Authors: Oleksandr Komarida, Kostyantyn Kosyachenko, Nataliia Sakhnatska

Data type: docx

Copyright notice: This dataset is made available under the Open Database License (<http://opendatacommons.org/licenses/odbl/1.0>). The Open Database License (ODbL) is a license agreement intended to allow users to freely share, modify, and use this Dataset while maintaining this same freedom for others, provided that the original source and author(s) are credited.

Link: <https://doi.org/10.3897/pharmacia.73.e196917.suppl1>