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STATE POLICY OF PHARMACEUTICAL WORKERS TRAINING

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ДЕРЖАВНА ПОЛІТИКА ПІДГОТОВКИ ФАРМАЦЕВТИЧНИХ ПРАЦІВНИКІВ

Одним з найважливіших завдань проведення державою політики є захист здоров'я громадян шляхом забезпечення ефективного функціонування системи охорони здоров'я, спрямованого на підвищення рівня і якості життя населення, підтримка його ефективності. Одна з центральних складових системи охорони здоров'я - фармацевтична промисловість країни, в зв'язку з чим різні аспекти її функціонування і розвитку є предметом досліджень вчених усього світу. Отже, виникає проблема формування професійних кадрів, які б могли відповідати Європейським стандартам обслуговування.

У роботі розглянутий сучасний стан фармацевтичної галузі в Україні та доведено існування попиту на фармацевтичних працівників з якісною освітою. Вивчено основні законодавчі акти в сфері фармацевтичної освіти. Проаналізовано освітні програми за спеціальністю «Фармація» та відповідні вакансії. Систематизовано цілі та елементи Національної

фармацевтичної політики. Досліджено динаміку кількості аптек на українському ринку. На основі аналізу наукових та літературних джерел у статті формується структура органів управління фармацевтичною промисловістю. Визначено основні проблеми фармацевтичної освіти в Україні.

Розглянутий сучасний стан підготовки спеціалістів для фармацевтичної галузі та особливості такої освіти під час пандемії. Вивчений іноземний досвід розвитку фармацевтичної освіти. Лідерами у фармацевтичній освіті є: Німеччина - 16 фармацевтичних факультетів; Франція - 24; Великобританія - 19; Іспанія - 15; Бельгія - 10; Польща - 10. Тому, досвід саме цих країн був досконально проаналізований в роботі. На основі досвіду стажування в Німеччині (Praktikumsbörsen), у статті пропонується запровадити систему підписання контрактів з приватними аптечними мережами та створити електронний ресурс для сприяння працевлаштуванню та пошуку баз практики, яка об'єднала б абітурієнтів, роботодавців та освітян.

На прикладі Комунального закладу Сумської обласної ради «Шосткинський фаховий медичний коледж» визначені недоліки фармацевтичної освіти та запропоновані шляхи її удосконалення на рівні країни.

Метою дослідження є дослідження основних тенденцій розвитку державної політики професійної підготовки фахівців фармацевтичної галузі в Україні.

Предметом дослідження є відносини, що виникають при підготовці фармацевтичного персоналу.

Об'єктом дослідження є професійна підготовка фахівців фармацевтичної галузі в Україні.

Методи дослідження: метод наукового пізнання, системний підхід, експертний метод та методи екстраполяції.

One of the most important tasks of state policy is to protect the health of citizens, effective functioning health system, improving the level and quality of life of the population, maintaining its effectiveness. One of the central components of the health care system is the country's pharmaceutical industry. In this regard, various aspects of its functioning and development are the subject of research by scientists around the world. Thus, there is a problem of forming professional staff that could meet European standards of service.

The current state of the pharmaceutical industry in Ukraine is considered in the work and proved the existence of demand for pharmaceutical workers with quality education. The article analyzes the educational programs in the specialty "Pharmacy" and the corresponding vacancies. The goals and elements of the National Pharmaceutical Policy are systematized. The dynamics of the number of pharmacies in the Ukrainian market was studied. Based on the analysis of scientific and literary sources, the structure of the governing bodies of the pharmaceutical industry is formed in the article. The main problems of pharmaceutical education in Ukraine are identified.

In the article the basic legislative acts in the field of pharmaceutical education are studied. The current state of training for the pharmaceutical industry and the peculiarities of such education during a pandemic are considered. The foreign experience of development of pharmaceutical education is studied. Leaders in pharmaceutical education are Germany - 16 pharmaceutical faculties; France - 24; Great Britain - 19; Spain - 15; Belgium - 10; Poland - 10. Therefore, the experience of these countries was thoroughly analyzed in the work.

The Shostka Professional Medical College Municipal Institution of the Sumy Regional Council was analyzed as a case. The shortcomings of pharmaceutical education were identified and ways to improve it at the national level were proposed.

Based on the experience of internships in Germany (Praktikumsbörsen), the article proposes to introduce a system of signing contracts with private pharmacy chains and creating an electronic resource to promote employment and find a base of practice that would unite applicants, employers and educators.

The purpose of the article is to study the main trends in the development of state policy of training of specialists in the pharmaceutical industry in Ukraine.

The subject of the study is the relationship that arises between the state and customers in the training of pharmaceutical personnel.

The object of research is the professional training of specialists in the pharmaceutical industry in Ukraine.

Research methods: method of scientific cognition, system approach, expert method and extrapolation methods.

Ключові слова: *фармацевтична освіта; фармація; фармацевтична наука; підготовка фармацевтичних кадрів; заклади освіти.*

Keywords: *pharmaceutical education; pharmacy; pharmaceutical science; training of pharmaceutical staff; educational institutions.*

Problem statement. Radical changes in social and economic relations in Ukraine as well as its integration into the European educational space require the constant improvement of specialists' professional training. The professional training of a pharmaceutical specialist in modern conditions is of priority importance, since it makes a significant contribution to the further development of public health, the preservation and strengthening of public health and the various diseases prevention. In fact, it is the highly qualified specialists of the pharmaceutical industry who can ensure the search and improvement of new effective methods of treatment and diseases prevention. The topic is relevant also due to the sale of medicine without prescription that is typical for Ukraine. In such situation, the pharmacist is the professional who can assess the condition of visitor's health and make the correct diagnosis. At the same time, today the pharmaceutical industry and the medical industry are developing quite intensively in Ukraine. Networks of pharmacies are developing throughout Ukraine. Therefore, it is necessary to train a sufficient number of pharmaceutical specialists.

European integration puts forward special demands for graduates of the speciality *Pharmacy*, such as lifelong education, the communication skills development and the ability to increase sales. Therefore, it became necessary to study the state policy in the field of specialists' training in the speciality *Pharmacy*, to determine its main directions, advantages and disadvantages.

Analysis of recent research and publications. The condition and problems of the development of pharmaceutical education were studied by the scientists as follows : Aliexieieva I. M. [1], Boichuk I. [2], Budanova L. G. [3], Kaidalova L. G. [4], Lytvynenko L.L., Sobkova A.O. [5]. Volk N.V. [6], Manchenko O. V. et al. [7], Nemchenko A. S., Khomenko V. M., Yarmola I. K. [8] consider the public authorities managing pharmaceutical education. The foreign experience of pharmaceutical education was considered in the research of Govorukha M. O. [9], Goncharuk A. Yu. [10], Goroshko O. M. et al. [11], Zarichna T. P. Et al. [12], Kalashnikova S.A. [13], Ohar S.V., Chernykh V.P. [14], Okhrei V. [15]. Modern topical issues of the history of medicine and pharmacy in Ukraine were considered by Zimenkovskyi B.S. [16].

Research methods: method of scientific cognition, systems approach, expert method and extrapolation methods.

Purpose of the research is to study the key trends of the development of state policy on professional training of specialists of the Ukrainian pharmaceutical industry.

Results. The topic of the pharmaceutical education development becomes more relevant due to the increasing demand for pharmacists and licensed pharmacist. It is caused by the growth of the pharmaceutical market. According to Pro-Consulting data, the pharmaceutical services market is actively developing both in volume and in value terms.

The number of pharmacies on the Ukrainian market has not changed significantly recently. The number of chemists decreased by 723 units in 2020 compared to 2019. Figure 1 [17] shows the Ukrainian pharmaceutical market dynamics.

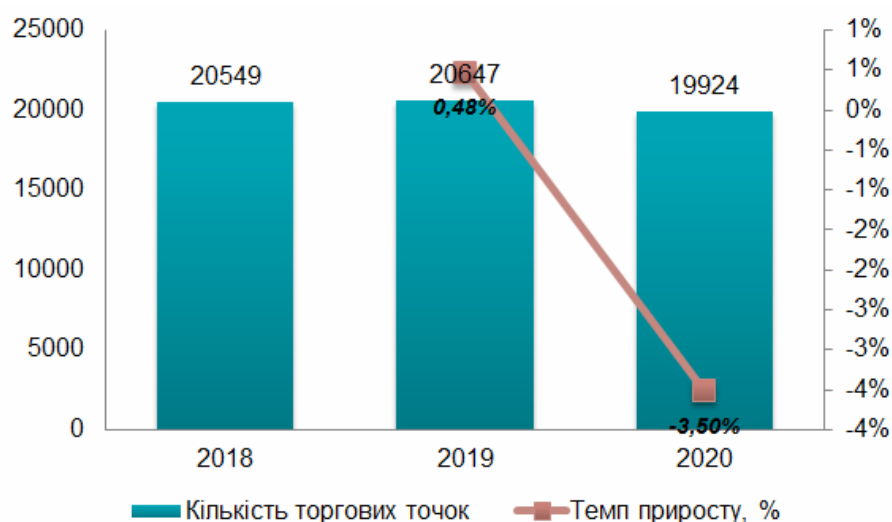


Figure 1 – Dynamics of the number of chemists in 2018-2019

It should be mentioned a trend towards an increase in the number of large pharmacies networks and a decrease in chemists' shops. To date, the ratio between them makes 80% and 20%, while the growth rate of their income makes 12.9% and 12.2%, respectively.

As of 01.01.2020, the number of pharmacies is about 20.000 outlets, including 16.000 pharmacies and 3.900 chemists' shops. The number of people working in pharmaceutical institutions makes 48.200 (26.992 pharmacists (56%) and 21.208 licensed pharmacist (44%)). [18, 19]

In Ukraine, there are 43 pharmacies per 100.000 population, in Spain – 46, Italy – 30, Great Britain – 21, Germany – 26. Thus it can be concluded that situation in Ukraine is similar to most of the EU countries. At the same time, the number of services provided by pharmacies in the EU is much higher than in Ukraine. In Poland and Germany, almost all pharmacies are engaged in extemporaneous medicine preparations. Therefore, these pharmacies needed the qualified pharmacists. In Ukraine, unfortunately, small number of pharmacies manufacture the medicine [18].

To date, per 100.000 population there is only 1 pharmacy that manufacture the medicine in Ukraine. The pharmacies that have licenses to manufacture medicine employ 5.21% of pharmacists, and chemists' shops - 3.15% of total number of pharmacists.

The national pharmaceutical policy is defined by the *Concept of the development of the pharmaceutical industry of the healthcare system of Ukraine for 2011-2020* [20] and the *Law of Ukraine On Medicinal Products* [21]. These legal acts define the goals and elements of the pharmaceutical policy of Ukraine (Fig. 2).

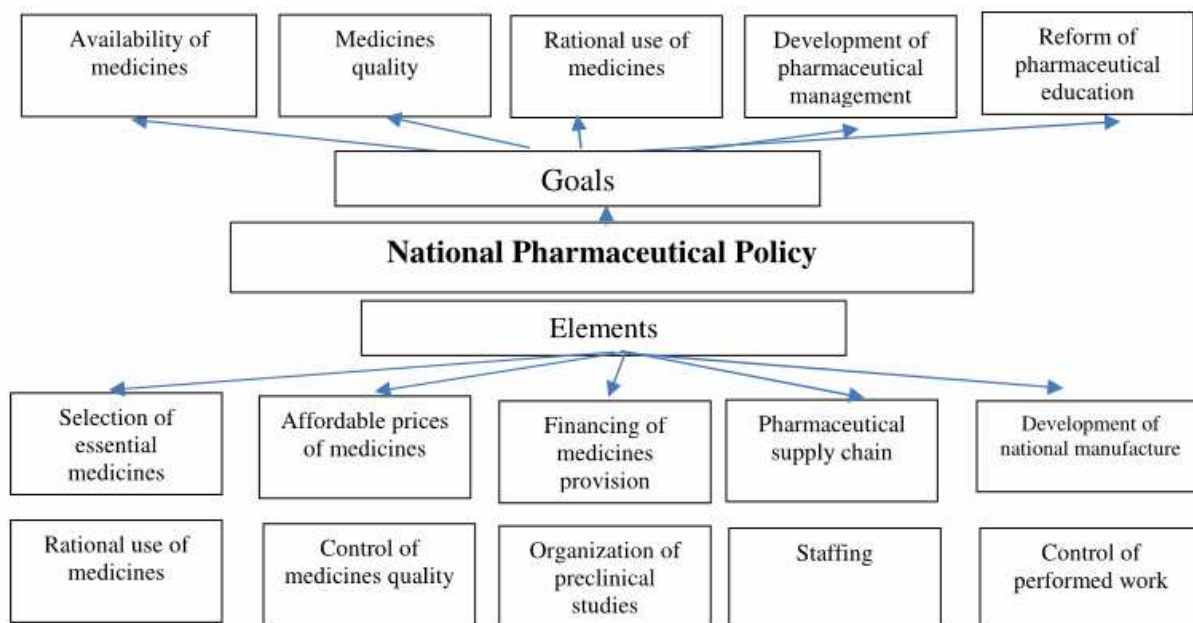


Figure 2 – Goals and elements of the National Pharmaceutical Policy

At the same time, there are some problems related to the development of pharmaceutical education. On the one hand, the pharmaceutical industry is fully commercialized, and no one wants to pay salary to ineffective employee with low levels of competence. On the other hand, the commercialization of the pharmaceutical industry leads to a reduction of state-financed openings for pharmaceutical specialities, due to the ineffectiveness of budget funds use.

The key players in the pharmaceutical market are shown in Figure 3.

It is evident, that the Ministry of Health of Ukraine is the key regulatory institution of the pharmaceutical market. According to the figure, it can be noted that the pharmaceutical support department includes 5 expert groups. It is also should be noted the department of managing human resources of the pharmaceutical industry and pharmaceutical education.

The development of Ukrainian pharmaceutical education started in 1990s. The significant changes were observed in the economy and education sector during this period. The directions of pharmaceutical education in Ukraine were focused on restoring and making significant adjustments to the goals, objectives and content of the educational process, that was reflected in the *Concept of multi-stage continuing education* [26], approved by the Ministry of Health of Ukraine in 1991.

It should be noted that until 1992 the direction *Pharmacy* includes only one speciality. In the years since independence, the significant changes have taken place in this direction. Taking into account the needs of pharmaceutical education in 1997, the amendments and additions were made to the *List of directions and specialties of vocational training*, approved by the Decree of the Cabinet of Ministers of Ukraine No. 507 as of May 24, 1997 (repealed) [27].

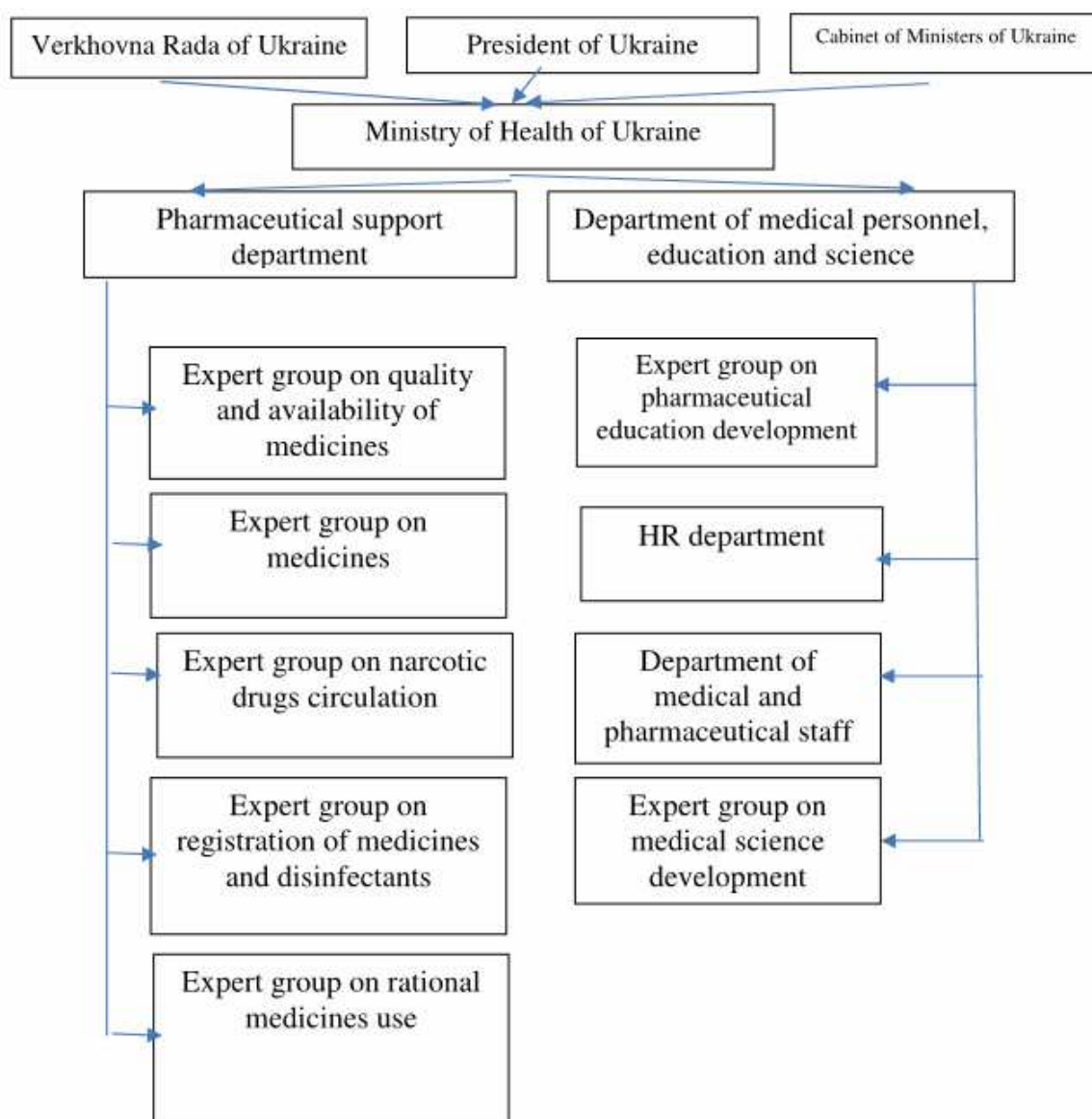


Figure 3 – The structure of the regulatory authorities managing the pharmaceutical industry
(based on [22, 23, 24, 25])

In 2015, a new edition of the *List of knowledge fields and specialties by which the training of applicants for higher education is carried out* was approved by the Decree of the Cabinet of Ministers of Ukraine No. 266 as of April 29, 2015. According to it, the speciality *Pharmacy* was given a code 1202 and belongs to the knowledge field of *Healthcare* [28] and has the educational programs [29, p. 41; 30, p. 18-20; 31, p. 78-81, 32, p. 191] that are presented in table 1.

The Cabinet of Ministers approved the *State Strategy on Implementing the State Policy on Providing the Population with Medicinal Products for the period until 2025* (Decree No. 1022), [33]. The main objectives of the policy are as follows: to improve the health of the population, to provide patients with a sufficient amount of high-quality, effective and safe medicines and their rational use in accordance with the clinical needs of patients [34].

Table 1 – List of educational programs by speciality *Pharmacy*

Education level	Educational programs	Positions that can be occupied
Junior specialist	<i>Pharmacy, Analytical quality control of chemical medicinal compounds, Manufacture of pharmaceuticals</i>	Pharmacist, laboratorian
Bachelor	<i>Pharmacy, Clinical Pharmacy, Technologies of pharmaceuticals, Technologies of perfumery and cosmetics.</i>	Pharmacist - licensed pharmacist, licensed pharmacist, pharmacist of analytical laboratory
Master	<i>Pharmacy</i>	Researcher, professor at the university, consultant, advisor, managerial positions

The speciality *Pharmacy* became an intermediate link between a doctor and a licensed pharmacist. The goal of the licensed pharmacist is to instruct the patient, identify the patient's problems, explain the side effects of medicines, and to make some corrections on prescribed medicines agreeing it with the doctor. This is the main advantage of medical reform – when a patient cannot buy medicines without a doctor's prescription [35].

To date, the education sector is being reformed and requires changes at the national level. Thus, in 2016, the Law of Ukraine No. 1556-VII *On Higher Education* [36] was adopted and it made many changes to the education system both in the financial and in management fields. This law also introduced new level of training by the speciality *Pharmacy* – Master of Pharmacy.

The Law of Ukraine *On Education* [36] limited the training of pharmaceutical staff by part-time study. Training by part-time study allows to obtain only the diploma of a junior bachelor of pharmacy with studying period of 5 years.

According to the results of research and the requirements of the World Health Organization [37], the competence of pharmacists includes the following: providing pharmaceutical care to all who need it; knowledge, skills and abilities in the professional field; communication skills, the communication ability, communicate with visitors of pharmacies, etc. According to the experts of the World Health Organization, it is necessary to add the courses and practical training to the curricula for obtaining bachelor degree specialist (pharmacy field). These courses and practical training will include work in clinics, medical care, therapeutic practice, medicines management, medicines rational use.

Currently, 39 educational institutions (13 – institutions of higher education and 26 colleges) carry out the training of specialists of the pharmaceutical industry in Ukraine. As of 01.09.2020, 18853 students are studying at the pharmaceutical faculties. These faculties employ 1177 educators of specialized departments, including 156 doctors of sciences, 665 candidates of sciences, 355 people without an academic degree (30%) [38].

The pharmaceutical education model is given in Figure 4.

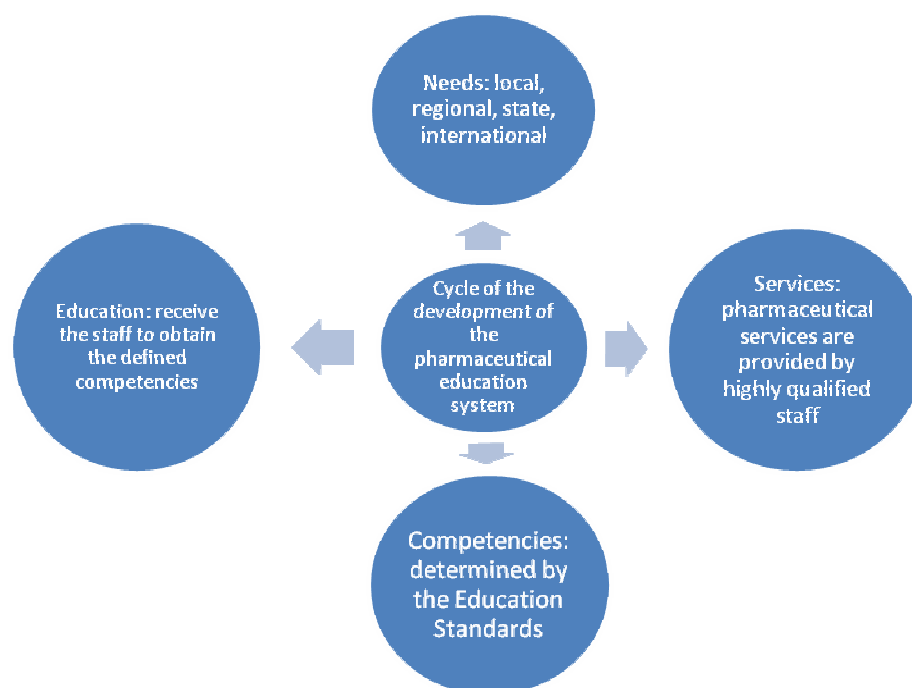


Figure 4 – Pharmaceutical education model [39, p.19]

The quality of education in the speciality *Pharmacy* is ensured by the control of students' knowledge through exams *Krok-1* and *Krok-2* prepared by the Ministry of Health of Ukraine [40]. The quality of education is determined by the passing these particular exams. Assessment of the quality of education in the speciality *Pharmacy* is presented in table 2.

The table shows that the average score of students by the speciality *Pharmacy* makes 76-77 points. Exam *KROK-1* confirms this success level and makes 82.5 points.

The leaders in pharmaceutical education by number of pharmaceutical faculties are Germany – 16; France – 24; Great Britain – 19; Spain – 15; Belgium – 10; Poland – 10. In contrast, such countries as Croatia, Slovenia, Ireland, Macedonia, Luxembourg, Malta, Slovenia, Bosnia and Herzegovina has only one pharmaceutical faculty [42, P. 69, 43, 44, P. 109, 45].

Nowadays the educational legislation of Ukraine in the field of education sufficiently considers the needs of the state, society, employers and students. Thus, according to the Law of Ukraine *On Higher Education* [36], the employers were given broad powers to influence the formation and implementation of state policy in the field of education. They can be members of examination board on students' attestation, participate in the development of branch standards, in the preparation and adoption of draft regulations and other decisions concerning the functioning of the higher education system, participate in the educational process and exercise public control in the field of education. Therefore, while preparing the draft of higher education standard of Ukraine (Knowledge field 22 *Healthcare. Speciality 226 Pharmacy. Industrial Pharmacy*) in 2018, the requirements of the key stakeholders – the state, society, representatives of the pharmaceutical market – employers and students were taken into account.

Table 2 – Analysis of pharmaceutical education quality [41, P. 141]

Educational program, specific features of students enrolled	Current rating	Exam	KPOK-1
<i>Pharmacy</i> (without vocational secondary education)	76.03	75.72	82.14
<i>Pharmacy</i> (vocational secondary pharmaceutical education)	81.48	83.33	91.27
<i>Pharmacy</i> (vocational secondary medical education)	72.42	79.16	83.08
<i>Clinical Pharmacy</i>	79.13	87.13	85.09
<i>Technologies of perfumery and cosmetics</i>	72.0	75.05	74.78
Total	76.08	77.16	82.54

Taking into account the requirements of the state and society as well as the requirements of employers to the level of general and professional (special) competencies of a pharmacist / licensed pharmacist, makes it possible to single out the following:

- knowledge, mainly special, closest to practice, as well as interdisciplinary (quality control of medicines manufactured in the prescription department, medicines manufacture, organization and procurement of medicines, etc.);
- ability and capability to acquire knowledge throughout life (for example, on the medicines manufacture, reporting rules, etc.)
- the ability to work with clients of pharmacy services, colleagues, representatives of the pharmaceutical industry that provides the availability of such social skills as customer orientation, communication, responsibility, politeness, patience, emotional stability, etc. [46]

At the same time even in the period of constant education reformation and the educational standards development, there are remain problems that have not yet been solved either at the state level or at the level of educational institutions.

The following problems of pharmaceutical education in Ukraine were identified while research:

- inconsistency of pharmacists' qualifications with the European standards. A specialist who received a higher pharmaceutical education can hold the position of a pharmacist in other countries, but in Ukraine – the position of a licensed pharmacist. A person who received vocational secondary education can work as a technician or pharmacy assistant in the European countries, and in Ukraine – as a pharmacist. In developed countries, only a specialist with a higher education is allowed to work with a patient, and a technician can only work under the supervision of a licensed pharmacist, because he/she is not allowed to independently decide which medicine should be prescribed to a patient [47, 18].

- Ukrainian diploma requires a nostrification procedure. That is the graduates in the speciality *Pharmacy* should confirm their knowledge and pass difficult exams [18].

- Quality of graduating pharmacists training. The educational programs do not always comply with the European standards. Programs do not contain the course *Medicines marketing*, etc.

To solve the above mentioned problems we suggest to carry out the measures as follows:

- integration of modern practice-oriented knowledge to the curriculum. The pharmaceutical industry is rapidly developing, new viruses are emerging as well medicines against them. Students should know the modern treatment methods. Especially taking into account the fact that sale of medicine without prescription is not prohibited in Ukraine. That is why very often the pharmacist is the only medical staff with whom the patient can consult.

- standardization of domestic pharmaceutical education with the European standards. The graduates of pharmaceutical educational institutions should possess the knowledge of international titles of medicines to understand the European treatment practices.

- review of education content, implementation of effective pedagogical technologies, forms and methods of teaching. This is very relevant in terms of a pandemic, when quarantine is constantly being enforced. The implementation of a distance learning system, constant updating of the software of the educational process, and the creation of electronic textbooks are relevant. The relevance of distance interactive simulators and interactive classes is increasing.

The offer of personal grants for studies, that is a common practice for the European countries, will ensure competition between students and improve the quality of the educational process. It will also ensure the involvement of employers to the activity of educational institutions. The employers can provide grants to those students who have obtained better results while studying or/and during practical training. Moreover, such approach will ensure the employment of students and the formation of competencies that are needed by the employers [18].

The next step is the development of the list of directions and specialities according to the needs of pharmaceutical industry and the cooperation with employers.

- ensuring the consistency and continuity of pharmaceutical education programs. For example, training of applicants in biological classes, then studying in colleges with further entering the universities.

- the formation of students' desire for self-improvement and self-education. The students at foreign universities obtain 80% of information on their own. To receive such result, it is necessary to foster such an approach both among students (starting with the first year of studying) and among teachers.

To achieve these measures, we suggest to carry out the following activities at the state level:

- implementation into practice the Order of the Ministry of Health of Ukraine No. 408 as of 06.07.2015 [48] on the creation of university clinics, on the basis of which students will be able to pass practical training, including students of pharmacological specialties.

- development of a mechanism for the graduates' employment. To date, the Law of Ukraine *On Amendments to the Law of Ukraine On Higher Education on the graduates' employment* No. 1662-VIII as of 06.10.2016 repealed the compulsory employment of graduates by educational institutions. The Law states: "Higher educational institutions are not obliged to ensure the employment of graduates". Thus, the state, allowing students to study on state-funded place, prepares a specialist who can emigrate to other countries [49].

- approval of ethical principles for the specialists training in the speciality *Pharmacy*, which are based on the ethics of a pharmacist in his/her professional activities, the basics of communication with people who need additional help, commercial sales.

- commitment to the standards of the European countries on customer service, increasing social responsibility to society on the quality of healthcare services.

- enactment of the provisions of the Law of Ukraine *On Higher Education* dated No. 1556-VII as of July 1, 2014 [18] in the field of interaction with stakeholders. Since the training of future pharmacists in Ukraine can be effectively developed only in collaboration of education, science, manufacture, pharmacy chains and the institutions on quality control of medicines. Such a partnership can become an important step towards the development of a strategy and tactics to achieve the quality of training of the specialists of the pharmaceutical industry in Ukraine, taking into account the current challenges facing the pharmaceutical sector of our country. In our opinion, an important condition for ensuring the effectiveness of training of future pharmacists is, firstly, considering the needs of society in the providing services in the field of health care, disease prevention, and secondly, the implementation of successful world experience, in particular, the countries of the European Union. At the same time, the implementation of customer service standards, increasing social responsibility to society for the quality of medical care is still relevant.

The analysis of professional educational institutions that carry out the training of the students in the speciality *Pharmacy* revealed the following main problems:

- students are not provided with the bases for passing practical training and high-quality practical training. The lack of public pharmacies is an obstacle to high-quality practical training of pharmaceutical specialists, since private pharmacies do not always provide students with access to all organizational and technical processes. Therefore, it is suggested to sign agreements with private pharmacy chains and create an electronic resource to promote employment and search for a practical training base that brings together job seekers, employers and educators.

The development of such electronic resource provides the fulfilment of the following tasks:

- development of database of employers' vacancies and graduates' resume;
- review of the vacancies and resume and selection of students who fit the vacancy the best.
- distribution of students by training practice bases. Moreover, it would be good if this electronic resource contains all the forms necessary for practical training passing. For example, agreement, referrals, etc.
- appointment of supervisor for students for the period of practical training. In one electronic system, the supervisor will be able to issue assignments, evaluate the papers and issue grades.

It should be mentioned the positive experience of practical training in Germany, where students can apply to "online student exchanges" (Praktikumsbörsen).

On these platforms, one can receive the consultations concerning the practical training, and this can be either advice on the documents that must be submitted for passing practical training at a particular enterprise, or advice on obtaining a certificate of passing practical training.

Such information resource will allow:

- forming database on the subjects of pharmaceutical market and track the vacancies for graduates' employment;
- involving more representatives of pharmaceutical industry to the educational process;
- conducting sociological surveys among students and employers on various topics, such as assessing the quality of practical training of students through interviewing supervisors of practical training at the enterprises (i.e. stakeholders);
- increasing the level of awareness of graduates on vacancies on pharmaceutical market;
- monitoring the employment of graduates. For example, a college will have the data on the number of graduates who got job by the speciality; priority places of employment by type of activity of subjects of the pharmaceutical market; regions of employment, etc. [50].

Conclusions and prospects for further research. The research provides an overview of the pharmaceutical market and proves that the industry needs specialists with new knowledge. The goals and elements of the National Pharmaceutical Policy were defined and the structure of the regulatory authorities managing the pharmaceutical industry was considered.

The Decree No. 1022 of the Cabinet of Ministers approved *the State Strategy on Implementing the State Policy on Providing the Population with Medicinal Products for the period until 2025* with its main objectives that are as follows: to improve the health of the population, to provide patients with a sufficient amount of high-quality, effective and safe medicines and their rational use in accordance with the clinical needs of patients.

The experience of countries that are the leaders in the pharmaceutical education was analyzed. The experience of these countries concerning the implementation reforms to the education system was considered. The experience of the development of pharmaceutical education in Germany, Great Britain and France was studied.

The prospect for further research may be the development of higher education standards for the educational program *Pharmacy*, the development of programs of compulsory and optional courses for specialists' training in the speciality *Pharmacy* for obtaining the degree of junior specialist, bachelor and master.

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