

PECULIARITIES OF PRIORITIES AND CHALLENGE OF
PHARMACEUTICAL SCIENCES TO BE CONSIDERE IN IMPROVEMENT
OF REGULATION ISSUES OF PHARMACISTS PROFESSION

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Abstract

The main objective of the study was to analyze the peculiarities of pharmaceutical sciences priorities and challenges towards on pharmacists' profession regulation issues perfection and enhancement in Georgia. The study was a quantitative investigation by using questionnaires. A survey study was conducted. The in-depth interview method of the respondents was used in the study. Different types of approved questionnaires were used (respondents were randomly selected): questionnaires for chief pharmacists, patients, employed pharmacy faculty-students, health-care specialists, and pharmacist specialists. Were used methods of systematic, sociological (surveying, questioning), comparative, mathematical-statistical, graphical analysis. The data were processed and analyzed with the SPSS program. We conducted descriptive statistics and regression analyses to detect an association between variables. Statistical analysis was done in SPSS version 11.0. A Chi-square test was applied to estimate the statistical significance and differences. We defined $p < 0.05$ as significant for all analyses. According to the study results, the respondent young (up to 35 year) pharmacists vast majority considered that for successful work their knowledge was not enough in the subjects of pharmacology, pharmacotherapy, clinical pharmacy and pharmaceutical care. Therefore, in our opinion at university pharmacy programs and syllabuses need upgrade, adaptation and fit on new demands reality. In pharmacy faculty programs there should increase credits in the following subjects: pharmacology, pharmacotherapy, clinical pharmacy and pharmaceutical care. Above mentioned complex would help formation of the highly qualified pharmacist with deep and systematic knowledge. It is obvious that the contact hours in the pharmacology, pharmacotherapy, clinical pharmacy and the pharmaceutical care subjects within the

pharmaceutical education programs should be increased to ensure deep and systemic knowledge for the successful work. The Government should take care of the profession of pharmacist authority. The pharmacist's profession in the health care system should increase the authority and social importance by the state support. Pharmacist's profession should become of more power and authority; a pharmacist should have a much higher status in the healthcare system. Therefore, the role of a pharmacist is significantly increased in the healthcare system and is directly related to his professional education level. Therefore, pharmacist should have appropriate higher pharmaceutical education. All the mentioned is achieved then, when the pharmacist profession will move into the health-regulated professions list.

1. Introduction

A pharmacist is a health specialist, which distributes medications to patients on prescription, as directed by a doctor. Pharmacists have extensive knowledge of chemistry and drug therapy of different drugs and how they react to people, as well as how drugs interact with each other [1 – 3]. Pharmacists must accurately measure and a package of medicine, ensuring its security at the dosage and the patient. While typically the pharmacist does not choose or prescribe medication, the pharmacist educates patients on how to take the medication and what reactions or problems should be avoided [4 – 6]. Pharmacists, chemists are health professionals, who practice in the pharmacy, medical sciences, focused on the safe and effective use of medicines. A pharmacist is a member of the health care team directly involved in patient care [7 – 9]. Pharmacists are trained at the university level, to understand the biochemical mechanisms of action of drugs, drug use and therapeutic role, possible side effects, drug interactions and monitor settings [10]. Pharmacists interpreted this experience for patients, physicians, and other health professionals. Pharmacist's profession required: Bachelor of Pharmacy or Master of Pharmacy degrees and professional certificate and license in pharmacy [11 – 13]. Patient safety is a priority for all specialists-pharmacists-who care about health. Patient safety is defined as the prevention of harm to patients, including errors. For centuries, pharmacists were custodians/against the "poisons" of substances that may harm the community [14, 15]. Now more than ever is the responsibility of the pharmacist to safely receive medications for the patient. In opposite, in primary health care, pharmacists generally have more restricted straightforward approach to clinical patient records and another health care specialist, like clinical-based pharmacists are highly accessible to patients [16 – 18]. This provides patients with nice and good opportunities to search advices for the control of minor diseases or preventive care medicine, and occasionally more serious circumstances, constantly before searching assistance from the family Doctors [19, 20]. Pharmacist, according patients' need, transfers patients to the family Doctor, hospital or insurance company [21]. Therefore, pharmacists are in perfect situation and position to ensure a first full point of communication within the health care system, in a triage-pattern role or as a connection between other health care professionals, mainly family doctors and general medical practitioners [22 – 24]. Above mentioned aspirations are shown by some pharmacist scientists in western countries, who studied the pharmaceutical care services, where doctors access was limited [25 – 27]. The pharmacists distinguish the beneficial assistance and promotion to functioning as a bond between the various sites of health care division, such as distinction care, pharmacotherapy or pharmaceutical care or public safety [28, 29]. The cooperation of pharmacists with various

health care providers has as well demonstrated to have an affirmative influence in the judicial framework [30 – 33].

Main objective of the study was to analyze the peculiarities of pharmaceutical sciences priorities and challenges towards on pharmacists' profession regulation issues perfection and enhancement in Georgia.

2. Material and method

Research objectives are materials of sociological research: the study was quantitative investigation by using survey – questionnaire.

The in-depth interview method of the respondents was used in the study. Different types of approved questionnaires were used (respondents were randomly selected), e.g.

- Questionnaire for chief pharmacists: 410 chief pharmacists;
- Questionnaire for patients: 1506 patients (customers of drug-stores);
- Questionnaire for employed pharmacy faculty-students: 222 employed students;
- Questionnaire for health-care specialists: 307 public health specialists;
- Questionnaire for pharmacist specialists: 810 pharmacist specialists.

Totally 3888 respondents were interviewed in Georgia.

We used methods of systematic, sociological (surveying, questioning), comparative, segmentation, mathematical-statistical, graphical analysis. The data was processed and analyzed with the SPSS program. Results and discussion: The survey was conducted through the questionnaires. 1506 patients were interviewed in Georgia. Questions and answers are given in the tables. On each question are attached diagrams or table. Questionnaire and diagrams are numbered. The data was processed and analyzed with the SPSS program.

We conducted descriptive statistics and regression analyses to detect an association between variables. Statistical analysis was done in SPSS version 11.0. A Chi-square test was applied to estimate the statistical significance and differences. We defined $p < 0.05$ as significant for all analyses. In order to meet the objectives, set in the research we also used the results obtained through analysis of available official information, studies and opinions about pharmacists, as well as the methods of quantitative studies.

The research implementation required the sub studies of the peculiarities of pharmaceutical sciences priorities and challenges towards on pharmacists' profession regulation issues perfection and enhancement in Georgia [34 – 38]. Study of the data was processed and analyzed with the SPSS program. We conducted descriptive statistics and regression analyses to detect an association between variables. Statistical analysis was done in SPSS version 11.0. A chi-square test was applied to estimate the statistical significance and differences. We defined $p < 0.05$ as significant for all analyses.

In order to provide the study's ethical character each participant of it was informed about the study's goal and suggested of willingness of the work to be done. So, the respondents' written or oral compliance was got on that issue. All the studies were carried out by the selected organizations administrations' previous compliance. Informed consent form for each respondent to participate in an anonymous survey was used. During the whole period of research, the participants' incognita was also provided. For the international rules' and criteria' conformity this human subject comprising given study was discussed and confirmed on the Bioethics Committee sessions of the YSMU (Yerevan State Medical University).

3. Results

The respondents' young pharmacist' (up to 35 year) vast majority considered that for successful work their knowledge was not enough in the subjects of pharmacology, pharmacotherapy, clinical pharmacy and pharmaceutical care (see **Figure 1**). Therefore, in our opinion at university pharmacy programs and syllabuses need upgrade, adaptation and fit on new demands reality. In pharmacy faculty programs there should increase credits in the following subjects: pharmacology, pharmacotherapy, clinical pharmacy and pharmaceutical care. Above mentioned complex would help formation of the highly qualified pharmacist with deep and systematic knowledge. It is obvious that the contact hours in the pharmacology, pharmacotherapy, clinical pharmacy and the pharmaceutical care subjects within the pharmaceutical education programs should be increased to ensure deep and systemic knowledge for the successful work.

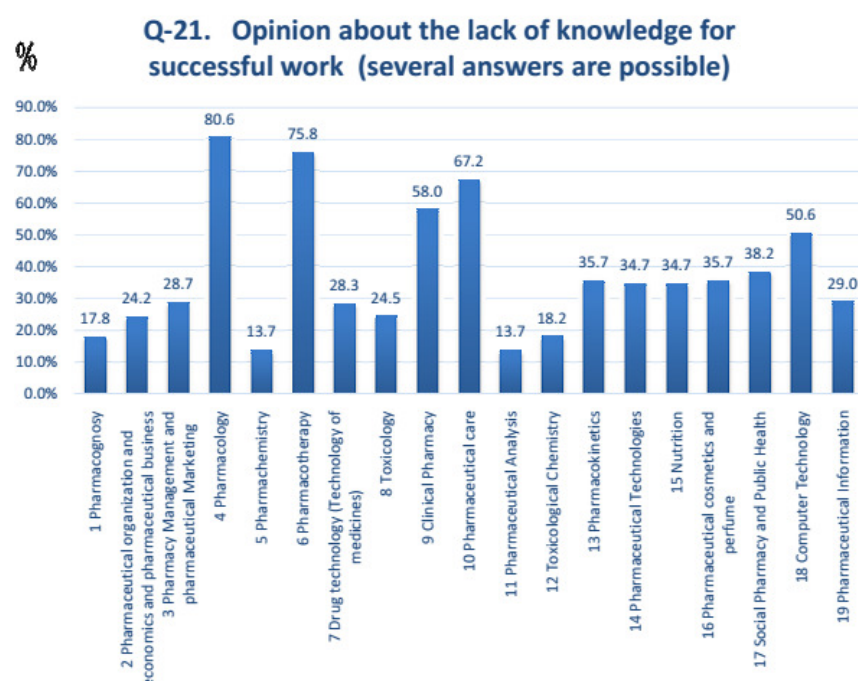


Figure 1. Respondents' opinion about lack of knowledge for their successful work.

Analysis the data of respondents answers on the question "Do you think that the Government should make the certification of pharmacists?" (Q). revealed the following in different categories. The majority of chief pharmacists, consumers of medications, employed students, healthcare specialists and pharmacists considered that Government should make certification of pharmacists ($p < 0.000$). There are statistically significant points between variables (see **Table 1**).

When coupling the data of respondents' answers analysis of the questions "Indicate your sex" (Q1) and "Do you think that the Government should make the certification of pharmacists?" (Q), it was obvious that there was not a significant difference between the variables ($p = 0.556$). There is no statistically significant attitude between sex and variables (see **Table 2**), this means "Gender" (Q1) and "Do you think that the Government should make the certification of pharmacists?" (Q12). So, answers are not dependent on sex.

Table 1. Respondents' opinion about pharmacists' certification.

Cross tabulation				
Do you think that the Government should make the certification of pharmacists?	Do you think that the Government should make the certification of pharmacists?			Total
	1. I agree	2. I partially agree	3. I do not agree	
Chief pharmacists	76.6 %	16.3 %	7.1 %	100.0 %
Customers	82.6 %	11.6 %	5.8 %	100.0 %
Employed students	95.9 %	3.6 %	0.5 %	100.0 %
Health-care specialists	94.8 %	4.6 %	0.7 %	100.0 %
Pharmacist specialists	71.9 %	21.9 %	6.3 %	100.0 %
Average	81.2 %	13.5 %	5.2 %	100.0 %
Chi-square tests				
	Value	Df	Asymp. sig. (2-sided)	
Pearson chi-square	132.625	8	0.000	

Table 2. Consumers of medications opinion about pharmacists' certification according gender.

Gender Cross tabulation				
Do you think that the Government should make the certification of pharmacists?	Gender (Q1)		Total	
	1. Female	2. Male		
Do you think that the Government should make the certification of pharmacists?	1. I agree	83.4 %	81.3 %	82.6 %
	2. I partially agree	11.0 %	12.6 %	11.6 %
	3. I do not agree	5.6 %	6.1 %	5.8 %
Total		100.0 %	100.0 %	100.0 %
Chi-square Tests				
	Value	Df	Asymp. sig. (2-sided)	
Pearson chi-square	1.173	2	0.556	

The respondents' (public health specialists) majority considered that importance in work of pharmacist was in personal realization as a specialist, receiving remuneration and provision of necessities of life. The respondents' minority considered it to be in relief of pain in suffering of people (see **Figure 2**).

**Figure 2.** Important issues in work for respondents – public health specialists.

Less than half part of the respondents – public health specialists considered that the level of basic training of pharmacists was not corresponding to the contemporary requirements (see **Figure 3**). According to the sociological study results of the public care specialists it is obviously,

that all pharmacists should have higher pharmaceutical education from the state recognized and accredited higher education institutions and universities. Pharmacists' specialty should become a regulated health care profession. According to that Government should make certification, licensing and accreditation of pharmacist professionals.

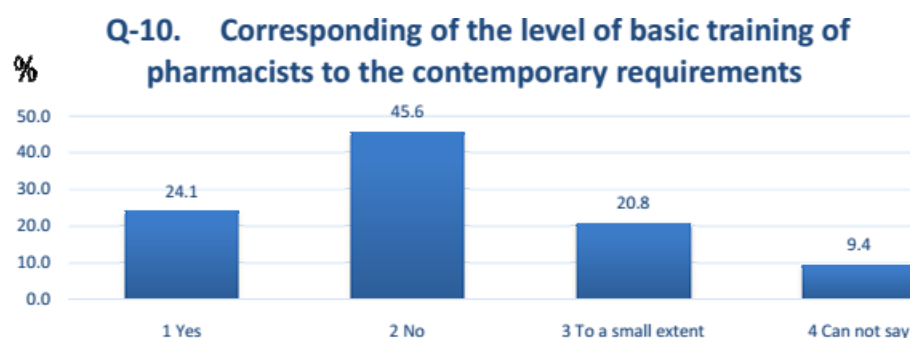


Figure 3. Respondents' opinion about pharmacists' basic training level correspondence to contemporary requirements.

The respondents' (public health specialists) vast majority considered that the issues to for pharmacists were in need of the further regular studies or trainings in the following fields: new medications, issues of pharmacotherapy of certain diseases, pharmacology and pharmacotherapy, drugs toxicity (see **Table 3**). From the study results it is obvious that in the higher pharmaceutical institutions' pharmaceutical educational programs and curriculum need upgrade, renewal, modernization and adaptation to the new modern medical challenges. Therefore, continuous pharmaceutical educational programs should be created. These programs should be more focused on new medications, pharmacotherapy, drugs toxicity and dosage, routes of drug administration, selection of OTC drugs, cost-effectiveness and cost-benefits of drugs.

Table 3. The respondents' (public health specialists) opinions about issues for pharmacists necessary for further regular studies or trainings.

#	Issues for pharmacists necessary for further regular studies or trainings (Q-11) – several answers were possible	Count	%
1	New drugs	187	60.9
2	Psychology of communication with customers	103	33.6
3	Issues of pharmacotherapy of certain diseases	197	64.2
4	Safety and effectiveness of drugs	154	50.2
5	Pharmacology and pharmacotherapy	224	73.0
6	Normative legal regulation of pharmaceutical activity	94	30.6
7	Drugs toxicity	164	53.4
8	Drugs dosage	112	36.5
9	Routes of drug administration	110	35.8
10	Drug forms	61	19.9
11	Drug design	43	14.0
12	Rules of drug administration	123	40.1
13	Drugs generic, chemical and brand names	57	18.6
14	Selection of OTC drugs	108	35.2
15	Cost-effectiveness and cost-benefits of drugs	96	31.3

Approximately half part of the respondents (public health specialists) was not familiar to the concept of pharmaceutical care; while more than a quarter of the public health specialists were well familiar to the concept of pharmaceutical care (see **Figure 4**).

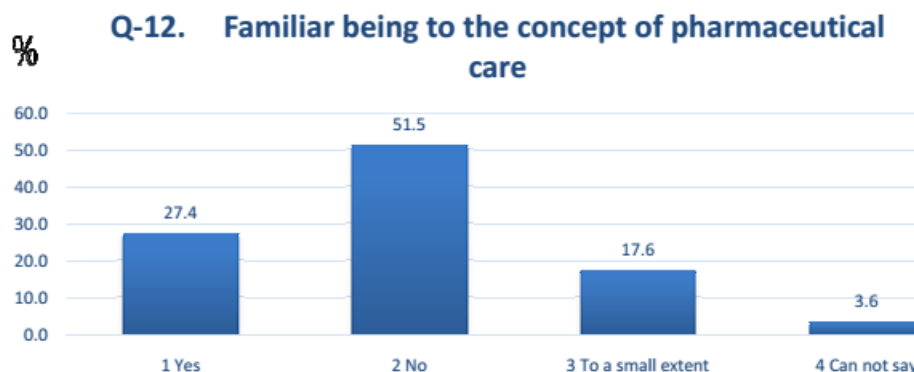


Figure 4. Respondents' (public health specialists) cognition of concept of pharmaceutical care.

The respondents' (public health specialists) large majority considered necessity of provision of cooperation between pharmacists and physicians on the issues of pharmacotherapy (see **Figure 5**). The pharmacist must provide information to doctor about new drugs pharmacotherapy, the generic replacement drugs, the cost-effectiveness and cost-benefits of drugs, drugs' generic, chemical and brand names. In our opinion and vision cooperation between pharmacists and physicians on the issues of pharmacotherapy is positively reflected on patients' health and has great importance for provision higher quality health care service for patients' safety.

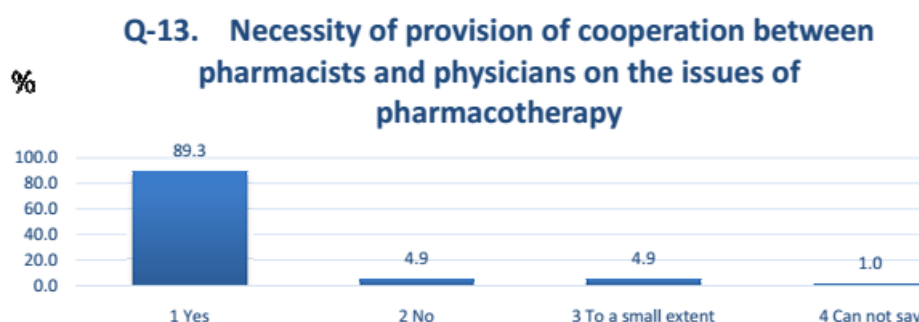


Figure 5. Respondents' opinion about necessity to provide cooperation between pharmacists and physicians on issues of pharmacotherapy.

More than half part of the respondents (public health specialists) considered that pharmacist is not in charge of treatment as a physician, meanwhile about a quarter of the public health specialists considered a pharmacist to be in charge of that (see **Figure 6**). Properly educated pharmacist can minimize and reduce the mistakes made by a doctor in the recipe. That has a great importance and value for provision higher quality health care service for patients' safety.

The respondents' (public health specialists) vast majority considered that pharmacist should provide assistance in teaching patients to understand the prescribed drugs intake rules (see **Figure 7**). According to that higher quality pharmaceutical service could be only provided by the pharmacists of higher pharmaceutical education, graduated from the authorized, accredited and licensed by the state higher education institutes and universities.

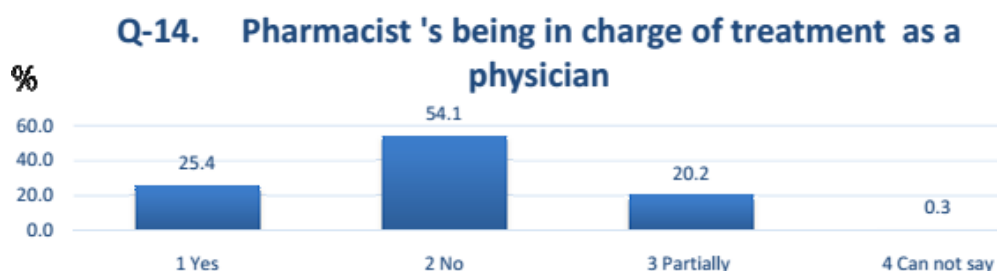


Figure 6. Respondents' (public health specialists) opinion about pharmacist's being in charge of treatment as a physician.



Figure 7. Respondents' (public health specialists) opinions about providing assistance by pharmacist in teaching patients to understand rules of intake of prescribed drugs.

Opinion that certification of pharmacists should be mandatory was more common among health care specialists than among chiefs (chi-square = 45.2, $p < 0.001$) and among pharmacists (chi-square = 68.9, $p < 0.001$), but there was no statistically significant difference between chiefs and pharmacists. It was more common also among customers /patients than in pharmacists (chi-square = 44.2, $p < 0.001$). The necessity of pharmacists' certification was stated more often by employed students than by pharmacists (chi-square = 57.3, $p < 0.001$).

Chi-square test of independence revealed that pharmacists more often than students mentioned mission (the desire to obtain a profession in compliance of own trends, aspirations and inclinations, personal desire, specialty love from childhood) as the main motive of their professional choice (65.5 % versus 55.8 %). Difference was statistically significant with chi-square = 9.9, $p < 0.002$. The difference between pharmacists and young specialists and young specialists and students wasn't statistically significant.

4. Discussion

On the basis of performed study results the following have been found.

The majority of higher pharmaceutical education pharmacists' specialists were female; among them the largest majorities were working on the pharmacist position at pharmacies. The Government and pharmaceutical companies should create promotional conditions for males to make pharmacist profession attractive for men. It is very important for career advancement and satisfaction to provide a balance between the workload and man personal life for the

satisfaction by income, for pharmacists' professional satisfaction, for pharmacist job satisfaction, and also for the career promotion perspectives.

The Government should take care of the profession of pharmacist authority. The pharmacist's profession in the health care system should increase the authority and social importance by the state support. Pharmacist's profession should become of more power and authority; a pharmacist should have a much higher status in the healthcare system. Therefore, the role of a pharmacist is significantly increased in the healthcare system and is directly related to his professional education level. Therefore, pharmacist should have appropriate higher pharmaceutical education. All the mentioned is achieved then, when the pharmacist profession will move into the health-regulated professions list.

The professional competency is mandatory for pharmacist specialists. Pharmacists' professional competency can be achieved by adopting of higher pharmaceutical education and by certification of pharmacist specialists. The higher pharmaceutical education, pharmacist specialists' certifications are the guarantee for higher professionalism of pharmacists and the pharmaceutical service provision in pharmacies.

The level of basic training of pharmacists should be in compliance with the contemporary requirements. The pharmacist should have deep knowledge in pharmacology, in pharmacotherapy, in toxicology, in pharmaceutical care, in clinical pharmacy, in pharmacokinetics, in pharmacodynamics, in basic of medicine and in other pre-clinical and clinical directions. Such knowledge can be obtained only in the higher pharmaceutical education institutions. Therefore, pharmacist working in pharmacy must have only higher pharmaceutical education.

To increase the pharmacist's professional qualification, professionalism, professional knowledge and competency the higher pharmaceutical education universities programs should more emphasize the mentioned subjects. It is too important, that a pharmacist should realize and understand that qualification upgrading study courses, professional trainings and professional workshops are of great necessity for further professional advancement. Thus, the Government should develop continuous pharmaceutical education programs accessible to all pharmacists. The qualification upgrading study courses, professional education or training courses should be available for all pharmacists. Pharmacist's education process should not be stopped. Developing a continuous pharmaceutical education system will enhance the professionalism of the pharmaceutical personnel. Experiential education should encourage perfection of critical opinion and the problem resolving processes along with the medicine discovery. Translation of professional pharmaceutical literature should be supported and implemented, with further inclusion in educational programs. International professional publications in pharmacy should be more accessible, as they are highly required for all pharmacists.

Pharmacy faculty students should take part in the patient care practice in hospitals, society proceeding settings and in other practical experiences. Students should have the possibility to apply the clinical and pharmaceutical information taught in classes when studying in medical facilities by working under the supervision of volunteer mentors (the healthcare specialists or professionals). The research activity of the pharmaceutical faculty students in all fields of pharmaceutical practice should be encouraged.

Quality reliance refers to the necessity to improve higher pharmaceutical education to guarantee a useful, sustainable and steady activity and appropriate skills and competencies of

the tomorrow's labor resources. The pharmacy degree programs should be proposed at the higher pharmaceutical institution level and entire experimental constituent element in the clinical facilities.

To raise the professional standards, the Government should make a certification of the higher pharmaceutical education pharmacists. It is very essential for pharmacist's professional perfection and professional growth, for self-realization and job satisfaction of the higher pharmaceutical education pharmacists, for the pharmacists' career advancement, their much higher status among the health care specialists and economic welfare, for their full realization of the received knowledge while working, for an opportunity to have private pharmaceutical activity, for the perspectives of professional promotion and correspondence of pharmacists qualification to the work performed. There is a substantial need for preparation and implementation of the registration-certification regulations for pharmacists' staff. Process of the pharmacists' certification should be started immediately.

To obtain more power and authority, much higher status, independence, self-realization, power, economic welfare, professional growth, career advancement the Government and private pharmaceutical companies should increase the salaries of pharmacists and the system of benefits' scheme for the pharmacist employees. The working conditions of pharmacists should be improved; the labor conditions should become more constructive for the pharmacist, providing more beneficial psychological climate within the collective and the possibility of career growth should be accessible to all pharmacists. The pharmacist's work schedule should become more flexible, and the job duration time per week should be reduced on the more effective for pharmacist's labor design. The flexibility will further improve pharmacists' workability and motivation toward the job, and also contribute to improve pharmacists' satisfaction according to the time duration of a job.

It is necessary to provide a deep cooperation between pharmacists and physicians on the issues of pharmacotherapy and healthcare to ensure the patients' health state effective improvement, and also to provide the best feedback regulation and revision in the healthcare specialists' team work. Pharmacists also should be responsible for registration of the drugs' side effect, as well as be attentive in case of improperness and professional defects of drugs they provide. To achieve that it is necessary to raise awareness of specialists on the essence of pharmacists' profession and functions among the medical personnel and general public.

On the basis of the theoretical and logical analysis the structure and composition of the factors have been developed, considering the objective (external), subjective (internal) and universal factors, which influence on the professional formation of the pharmacist. These factors comprised the content of work, position, correspondence of qualification and nature of work to capabilities, aspirations and inclinations of the pharmacist, the existence of perspective for professional promotion. The existence of perspectives for career promotion, the possibility to enhance qualifications, a high degree of responsibility for the work results, regimen, labor salary and the system of benefits scheme for employees, support and assistance of a manager, direct relations with manager and colleagues serve the essential base for the pharmacists' successful work. The unity of criteria for pharmacist professional formation, for the common professional formation (characteristic to all stages) and the specific professional formation (characteristic to the separate stage) had been developed.

The study of the professional adaptation of pharmacists indicated that inadequate professional knowledge, improper performance of the acquired professional skills were the

main reasons for imperfect pharmaceutical care supply. The majority of the pharmaceutical organizations' heads and also the young specialists considered the coexistence of a mentor (experienced professional pharmacist) as the main factor of professional improvement for pharmacists' professional adaptation. The pharmacists' personnel must show stirring involvement in sharing their cognition, understanding, science, skill and contributing partnership and cooperation within the colleagues and other health care professionals in pharmacy direction.

It is quite significant, that pharmaceutical companies regularly perform study of pharmacists' work satisfaction. The pharmaceutical companies should determine combination of factors that effect on the pharmacists' work satisfaction. Pharmaceutical companies should create favorable working conditions for pharmacists to enable the maximal realization of the pharmacists' professional capabilities, skills and habits. A balance between the workload and pharmacists' personal life should be more harmonized, convenient, resourceful and more poised. This will increase the quality of pharmaceutical care in pharmacies.

It should be noted, that pharmacist's satisfaction with income is a very sensitive factor that has a significant impact on the quality of pharmaceutical services performed in pharmacy, and so the pharmacists' salary should be revised and increased.

It should be noted that in developed countries and in many developing countries pharmaceutical specialty is regulated profession alike the family medicine. In western countries pharmacist as a family doctor need higher pharmaceutical education, diploma and continuous pharmaceutical education, pharmaceutical license and periodic accreditation. Only pharmacists with higher pharmaceutical education have the right to work as pharmacists' position in the pharmacies. On the pharmacists' certification programs should be only involved pharmacists who have graduated pharmaceutical faculties from state recognized and accredited universities.

5. Conclusion

The opinion that certification of pharmacists should be mandatory was more common among health care specialists, than among chiefs and pharmacists. The necessity of pharmacists' certification was stated more often by employed students, than by pharmacists. It was more common also among customers/patients than in pharmacists. Statistically significant was association between the patients' educational level and their opinion about the necessity of pharmacists' certification: customers with higher education considered certification of pharmacists as mandatory more often, than did patients with secondary education.

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