

PHARMACEUTICAL CARE IN OPINION OF POLISH MEDICAL AND PHARMACEUTICAL STUDENTS: AN EXPLORATORY STUDY

DAMIAN ŚWIECZKOWSKI¹, PIOTR MERKS², MIŁOSZ JAGUSZEWSKI^{1*} and DANUTA SILUK³

¹First Department of Cardiology, Medical University of Gdansk,
Dębinki 7, 80-211 Gdańsk, Poland

²Department of Pharmaceutical Technology, Nicolaus Copernicus University in Torun,
A. Jurasza 2, 85-089 Bydgoszcz, Poland

³Department of Biopharmaceutics, Medical University of Gdansk,
Gen. J. Hallera 107, 80-416 Gdańsk, Poland

Abstract: Pharmacy students should have a sufficient level of knowledge, skills, and attitude to practice pharmaceutical care effectively in the routine practice in the community pharmacy. Moreover, the strong cooperation between pharmacists and physicians is strongly needed in the process of providing pharmaceutical care. The aim of the study was to investigate the opinions of students of the Faculty of Medicine and Pharmacy from Medical University of Gdansk on pharmaceutical care and cognitive services and aspects of interprofessional collaboration between physicians and pharmacists under the conditions of Polish healthcare system. A cross-sectional questionnaire was given at the Faculty of Pharmacy and Faculty of Medicine at the Medical University of Gdańsk, Poland. Both, pharmacy and medical students expressed positive attitude towards pharmaceutical care. Medical students declared that pharmacists should be empowered to refill the prescriptions for medicinal products of the Rx category used in chronic diseases and have access to patients' medical records. However, in the opinions of students of the pharmaceutical faculty, physicians did not support the concept of pharmaceutical care. Pharmacy students identified obstacles to effective implementation of pharmaceutical care in community pharmacies, i.e., lack of time or lack of knowledge in the field of soft skills. Both, students from the Faculty of Pharmacy and Faculty of Medicine, Medical University of Gdańsk supported the idea of implementation of pharmaceutical care into Polish community pharmacies. Moreover, they recognized the process of evolution of pharmacists' competencies to more clinical role. Therefore, more representative studies are strongly needed to improve the development of pharmaceutical care in Poland.

Keywords: pharmaceutical services, pharmaceutical care, community pharmacy, Poland

Pharmaceutical care, defined as responsible provision of medication therapy to achieve definite outcomes that improve patients' quality of life (1, 2), is a result of development in pharmaceutical science, pharmacy practice, and growing needs of patients (3). This concept enriches the profession of a pharmacist on the background of other medical professions (4). Pharmacists providing pharmaceutical care should work with representatives of other health professions, e.g., physicians and nurses to provide the patient with holistic care to the highest possible degree (5).

The legal definition of pharmaceutical care in Polish legislation appeared in 2008 with the amendment to the Law on Chambers of Pharmacists (Dz.U. no. 47 par. 273, 19. 03. 2008). Pharmaceutical care

has been assigned to the profession of pharmacist and as such cannot be provided by pharmacy technicians. There is a limited number of research conducted from Polish perspective, however, an implementation of pharmaceutical care into the pharmacy practice should be considered a benefit both for patients and pharmacists (6). The process of implementation of pharmaceutical care in the reality of Polish community pharmacies is insufficient (7). Recently (August 2015), at the Ministry of Health, a team was appointed whose goal is to create a Polish model of reimbursed pharmaceutical care (8, 9). These changes are expected both by pharmacists and physicians and on the other hand by patients (10).

The aim of the study was to investigate the opinions of students of the Faculties of Medicine

* Corresponding author: e-mail: mjaguszewski@gumed.edu.pl

and Pharmacy at the Medical University of Gdańsk on pharmaceutical care, cognitive services and some aspects of interprofessional collaboration between physicians and pharmacists under the conditions of Polish healthcare system. Undoubtedly, the paper also contributed to promotion of pharmaceutical care among students of the Medical Faculty.

METHODS

This was a cross-sectional study, designed and carried out among the students of pharmacy and medicine at the Medical University of Gdańsk during the period of 2014 – 2015. A high level of confidentiality and anonymity was maintained throughout the study.

The research tool was an authorial questionnaire, voluntarily and independently completed by respondents. The questionnaires were distributed *via* e-mail by using the internal university electronic system (Extranet), personally or with the assistance of Deanery employees of the Faculty of Pharmacy. The questionnaire was based on the Likert statements and 'free-text' boxes to develop a deeper understanding of participant views. The research based on the triangulation concept, well-established approach in the social science. The relevant study was preceded by a multistep test of acceptability of the questionnaire in a deliberately selected group of respondents, identical to the final research population. Firstly, the questionnaires were checked for correctness and language purity, particularly in grammar and style.

Moreover, the cultural context of wording was carefully examined. Secondly, based on the qualitative approach, the questionnaires were discussed among the three students, both from pharmacy and medicine, in the light of accessibility. Finally, the pilot study was conducted. It should be highlighted that the results of the pilot study ($n = 10$) were not included in the results from the relevant sample. In addition, Gunning fog index was assessed as 10-12 level (easily understanding by the people after high school senior education). The characteristics of applied questionnaires are summarized in Table 1.

For statistical analysis Statistica 10.0 was used, as well as PQStat 1.6.0.512. Nonparametric tests, particularly based on the chi-square test were applied; p-values were considered statistically significant only if the p-value was less than or equal to 0.05 which implies that there was a 95% confidence in the analysis results.

The ethical approval was not required for this research.

RESULTS

Characteristics of the study group – students of the Faculty of Medicine

The study involved 116 respondents (in these, 2 students from Dentistry sub-faculty). The number of respondents from 1-3, 5 and 6 years of study was similar and ranges from 14-17 individuals). More detailed characteristics are presented in Table 2.

Table 1. The characteristics of applied questionnaires.

	Students of the Faculty of Medicine	Students of the Faculty of Pharmacy
The number of closed questions	10	13
The number of open questions	none	1
Research Period	01.12.2014 - 31.01.2015	May/June 2014; February 2015
Method - detailed information	<i>via</i> e-mail, internal university electronic system	Traditional questionnaire, paper based

Table 2. The characteristics of students of the Faculty of Medicine by year of study.

Year of study	The number of respondents	Percentage %
1	17	14.7
2	15	12.9
3	16	13.8
4	38	32.8
5	16	13.8
6	14	12.0

Table 3. Which definition in your opinion explains most accurately the concept of pharmaceutical care?

Definition	The number of responses	
	N	%
Documented process of pharmacists' and physicians' collaboration focused on drug-related problems and principles of effective pharmacotherapy.	53	45.7
The information about the basic principles of the medicinal products, i.e. dosage or interactions, etc. was given to the patient.	59	50.9
Pharmaceutical care focuses on information about generics - cheaper alternatives for innovative products.	4	3.4
Discussion about health-related problems, e.g. focuses on the treatment of hypertension or diabetes and promotion of healthy behaviors.	0	0.0
Demonstration of principles of proper measurement of blood pressure and glucose level or correct use of inhalers.	0	0.0
Total	116	100.0

Table 4. Do you think that pharmacists should be empowered to repeat prescriptions for Rx medicinal products for some chronic diseases?

	The number of responses	
	n	%
Strongly agree	22	19.0
Agree	50	43.1
Neither agree nor disagree	4	3.4
Disagree	30	25.9
Strongly disagree	10	8.6
Total	116	100.0

Table 5. Do you support pharmacists' access to the medical information system?

	The number of responses	
	n	%
Strongly agree	39	33.6
Agree	59	50.9
Neither agree nor disagree	6	5.2
Disagree	10	8.6
Strongly disagree	2	1.7
Total	116	100

Characteristics of the study group – students of the Faculty of Pharmacy

The participants were students of the Faculty of Pharmacy at the Medical University of Gdańsk after graduation or during obligatory preregistration training. The questionnaire was completed in the 2013/2014 academic year by 109 respondents (90.8% of graduates), whereas in 2014/2015 – 81 students (68.7% graduates). The period of conduct-

ed research was in the 2013/2014 academic year May – June 2014, while in 2014/2015 – February 2015.

Pharmaceutical care in the opinions of students of the Faculty of Medicine

The most important issue for the research conducted among students of the Faculty of Medicine was verification whether the respondents were

familiar with the proper definition of pharmaceutical care. Unfortunately, the majority of respondents did not indicate the correct definition of pharmaceutical care. Only 45.7% of respondents provided the first definition (Table 3), which emphasized the most important feature of pharmaceutical care under the condition of the Polish healthcare system, the documentation process.

Over 60% of respondents declared (answers: strongly agree and agree) that pharmacists should be empowered to repeat prescriptions for drugs used in some chronic diseases (Table 4).

Almost 85% of the respondents supported the idea that pharmacists should have access to the medical information system (Table 5). In the question it was highlighted that the access should be associated with the cooperation with physicians and is aimed at searching adverse drug interactions and educating patients diagnosed with chronic diseases. Furthermore, it showed statistically significant correlation – respondents who were in favor of pharmacists' access to medical-related information more often supported the idea of prescribing of Rx medicinal products by pharmacists ($p = 0.049$).

Table 6. Should pharmacists evince a more engaged attitude in the process of pharmacotherapy and provide pharmaceutical care to the patient?

	The number of responses	
	n	%
Strongly agree	29	25.0
Agree	55	47.4
Neither agree nor disagree	16	13.8
Disagree	12	10.4
Strongly disagree	4	3.4
Total	116	100.0

Table 7. Should active cooperation between physicians and pharmacists be promoted in the process of medical education?

	The number of responses	
	n	%
Strongly agree	61	52.6
Agree	43	37.1
Neither agree nor disagree	8	6.9
Disagree	3	2.6
Strongly disagree	1	0.8
Total	116	100.0

Table 8. Do you support the idea of common carrying out classes for the pharmaceutical and medical students, e.g., pharmacology?

	The number of responses	
	n	%
Strongly agree	7	6.0
Agree	31	26.7
Neither agree nor disagree	25	21.6
Disagree	35	30.2
Strongly disagree	18	15.5
Total	116	100.0

Table 9. Which competences should be assigned to profession of pharmacist, which, on the other hand, to medical profession? (You can select both answers, if you think cooperation should be applied).

Competences	Physician		Pharmacist		Pharmacist and physician	
	n	%	n	%	n	%
Selection of appropriate medicine in particular clinical situation (and / or dosing regimen)	87	75.0	2	1.7	27	23.3
Verifying the correct use of medicinal products and dosage regimen	38	32.8	14	12.1	64	55.2
Selection of appropriate formulation	48	41.4	18	15.5	50	43.1
Reporting adverse reactions	36	31.0	6	5.2	74	63.8
Obtaining information about all drugs (including OTC), which are used by patients	21	18.1	12	10.4	83	71.6
Searching for adverse drug interactions	11	9.5	18	15.5	87	75.0
Interpretation of laboratory tests in the field of Therapeutic Drug Monitoring	77	66.4	8	6.9	31	26.7
Education of the patient how to independently perform measurements (e.g., blood pressure)	39	33.6	6	5.2	71	61.2
Patient education about the nature of the disease	74	63.8	2	1.7	40	34.5

Table 10. How is pharmaceutical care implemented in Pomeranian community pharmacies (1 - indicates a frequently encountered situation, 2 - rarely, 3 - none)?

The definition	Frequency	Research group	Results in %
Documented process of pharmacists' and physicians' collaboration focuses on the drug-related problems and principles of effective pharmacotherapy	Not implemented	2013/2014 2014/2015	87.2 89.0
The information on basic principles of medicinal products, i.e., dosage or interactions etc. was given to the patient	Often implemented	2013/2014 2014/2015	65.3 72.0
Pharmaceutical care focuses on information about generics - cheaper alternatives for innovative products	Often implemented	2013/2014 2014/2015	89.4 51.0
Discussion about health-related problems focuses e.g., on the treatment of hypertension or diabetes and promotion of healthy behaviors	Rarely implemented	2013/2014 2014/2015	67.2 58.8
Demonstrating the principles of proper measurement of blood pressure and glucose level or correct use of inhalers	Rarely implemented	2013/2014 2014/2015	55.0 59.4

More than 72% of the respondents supported the idea that pharmacists evinced a more engaged attitude in the process of monitoring pharmacotherapy and provided pharmaceutical care to the patient (Table 6). In addition, students who were committed to pharmacist access to medical records objected to increased pharmacists' responsibility for clinical aspects of patient care ($p = 0.001$).

Vast majority of the respondents (almost 90%) declared that during medical education, the cooperation between physicians and pharmacists should be promoted (Table 7).

The majority of respondents, about 46% of individuals (answers: disagree, strongly disagree) did not support the idea of joint classes for the pharmaceutical and medical students (Table 8). Moreover, we observed a high number of students who had no opinion about this issue (over 21%).

The respondents, students of the Faculty of Medicine, attributed pharmacotherapy management the responsibility of both the physicians and pharmacists (Table 9). Respondents expected cooperation between the physician and the pharmacist in such areas as in obtaining information about all the

medicinal products used by the particular patient (71.6% of responses) and in searching for adverse drug interactions (75.0%). The majority of students ascribed the choice of a suitable medicinal product in a particular clinical situation (75.0% of respondents), the interpretation of laboratory tests in the field of therapeutic drug monitoring (66.4%) and educating the patient how to perform independently the correct measurements of blood pressure (63.8%) as a medical competence.

Pharmaceutical care in the opinions of students of the Faculty of Pharmacy

In both groups, respondents agreed that in the community pharmacies, where the students had professional internships, pharmaceutical care is not

implemented (2013/2014 – 57.0% of answers, 2014/2015 – 65.0%; Fig. 1). It should be emphasized, however, that further responses indicated that some elements of pharmaceutical care in the community pharmacy were effectively implemented, e.g., advising on medicinal products available without prescription (OTC category). In addition, the majority of respondents stated that pharmaceutical care in community pharmacies was not a documented process (87.2% and 89.0 %, respectively). The difference between the two research groups of pharmacy students was evident in the case of defining the pharmaceutical care as information about generic drugs (89.4% vs. 51.0%). In other cases, the distribution of answers to questions was comparable (Table 10).

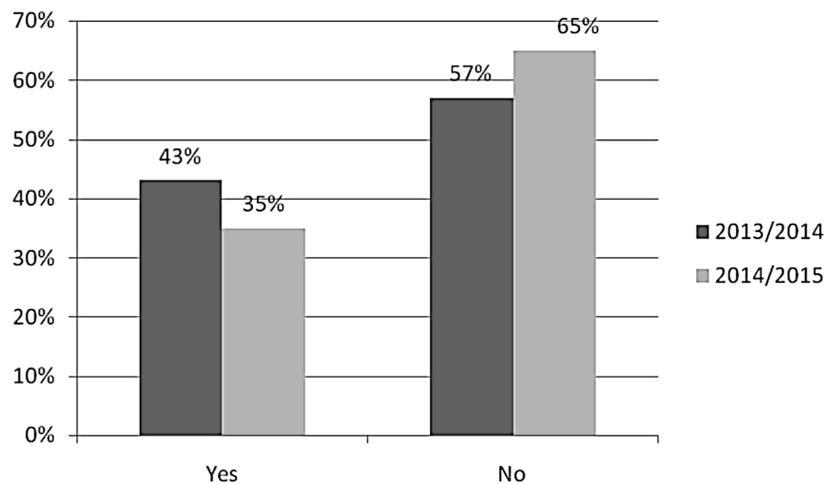


Figure 1. Is pharmaceutical care provided in the community pharmacy where you had your professional practice (results in %)?

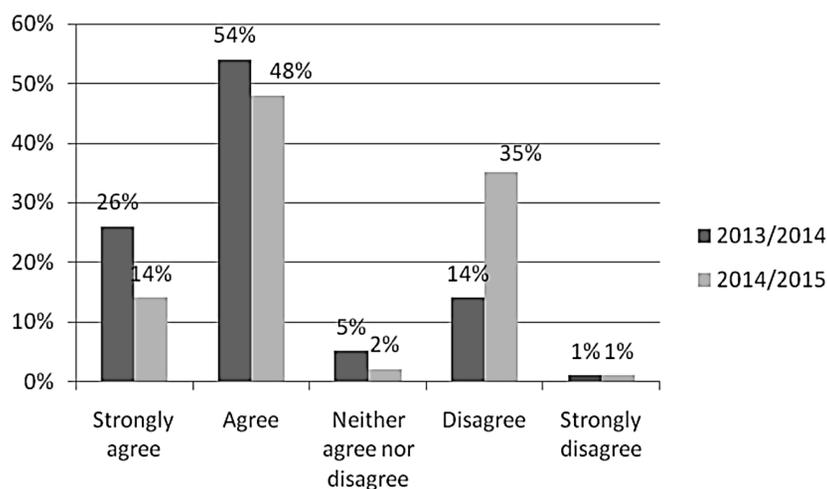


Figure 2. Do you think patients are interested in pharmaceutical care and a more engaged pharmacist' attitude in optimizing the pharmacotherapy (results in %)?

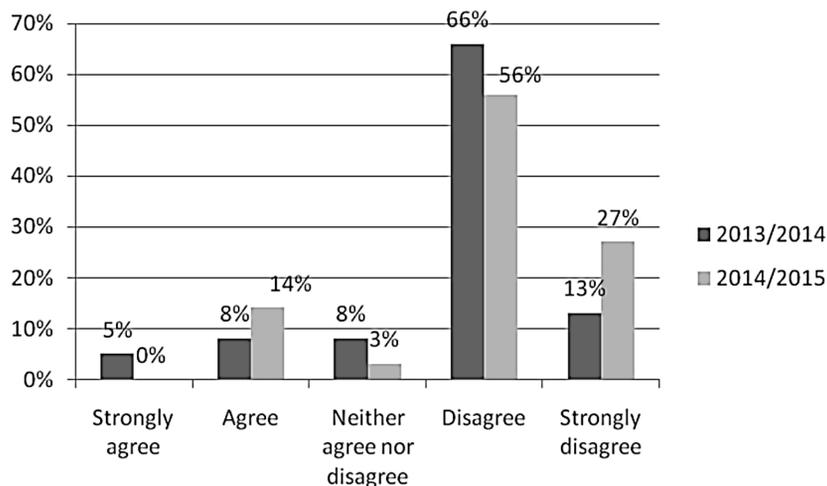


Figure 3. Do you think physicians wish that pharmacists evinced a more engaged posture in the process of pharmacotherapy and provide pharmaceutical care?

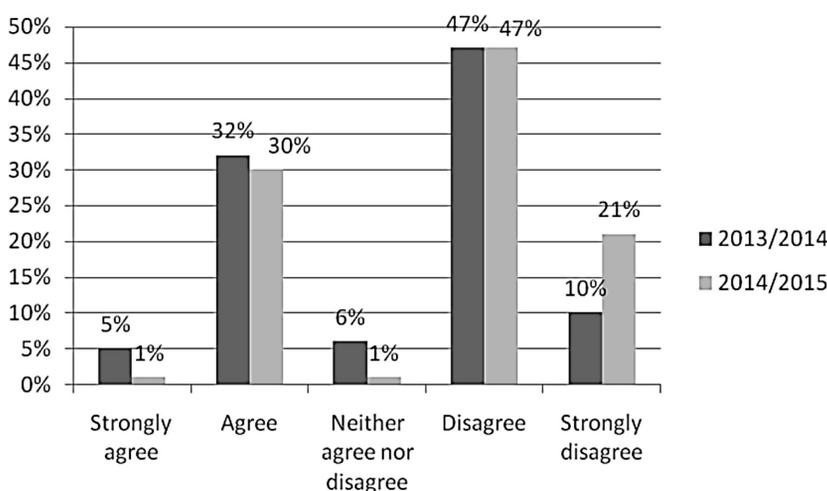


Figure 4. Do you think that the studies curriculum prepares to conduct pharmaceutical care independently (result in %)?

The vast majority of pharmacy students denoted that patients were interested in the implementation of pharmaceutical care and pharmacists might be more engaged in the process of optimizing the pharmacotherapy (Fig. 2).

Most pharmacy students indicated little physicians' interest in implementing pharmaceutical care and evolution of professional pharmacists' responsibilities. Both investigated groups were consistent in this matter, almost all students declared 'disagree' and 'strongly disagree' responses. The students interviewed in 2013/2014 were less critical ($p < 0.05$, Fig. 3).

The respondents were not sure about whether the pharmaceutical studies prepared for independent

provision of pharmaceutical care (Fig. 4). Respondents were divided into two extreme groups: the first is rather positive about the analyzed issues (majority answers 'agree'), and the second remained skeptical about the studies curriculum in the context of pharmaceutical care (answers 'disagree').

Respondents indicated a number of areas of knowledge and skills that pharmacy graduates lack to effectively provide pharmaceutical care (Table 11). Most important were the following: lack of knowledge in the field of advanced pharmacotherapy and lack of medical knowledge particularly in the field of the pathogenesis of diseases. In both analyzed groups, the distribution of responses was similar.

In addition, pharmacy students recognized the deficiencies in knowledge and stated that the pharmacist who wants to independently provide pharmaceutical care should undergo an additional certification process (Fig. 5).

Respondents recognized several barriers in effective implementation of pharmaceutical care into Polish community pharmacies (Table 12). As main obstacles respondents recognized: the conflict of competence between physicians and pharmacists, lack of time and legal aspects. Distribution of responses in both groups was similar.

DISCUSSION

Herein, we present a unique study that constitutes a part of an extensive research project and first such a broad perspective on the issue of pharmaceutical services in the opinion of Polish medicine and

pharmacy students. The most salient finding of the present study is that both the students of pharmacy and those from the Medical Faculty were interested in implementation of pharmaceutical care into Polish community pharmacies. Unfortunately, students from the Medicine Faculty were not familiar with the proper definition of pharmaceutical care. Last but not least, the students declared that pharmacists should have access to the medical record and could repeat the prescriptions for the medicinal products Rx only.

Last comprehensive research about pharmaceutical care was conducted in Pomerania in 2010. However, it concerned different aspects of pharmaceutical care and was conducted on a limited number of respondents and without applying modern investigative tools (11). To the best of our knowledge, this is the first work of this range which focuses on preregistration students' opinions on pharma-

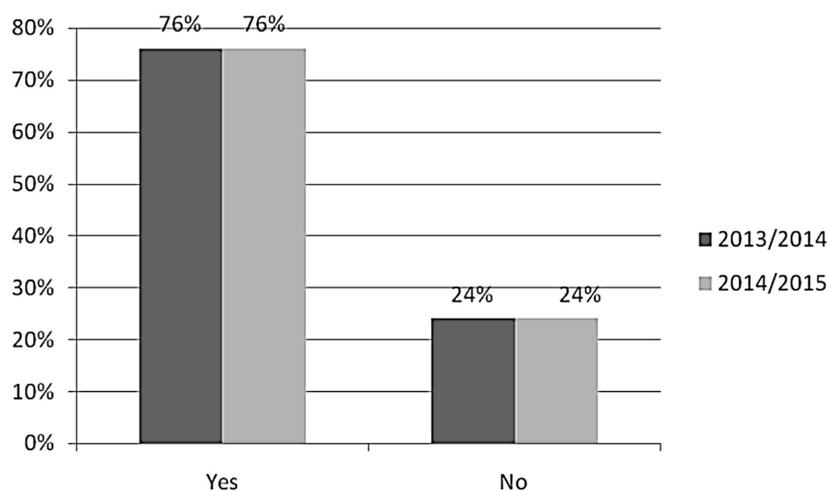


Figure 5. Do you think that the pharmacist who would provide pharmaceutical care should have an additional specialization or complete a certification process?

Table 11. What skills and knowledge do pharmacy students lack to effectively provide pharmaceutical care? (Please select a maximum of 3 answers).

Issues	Research group	Results in %
Knowledge about advanced pharmacology, pharmacotherapy and drug interactions	2013/2014	72.0
	2014/2015	62.3
Knowledge of the pharmaceutical law	2013/2014	10.8
	2014/2015	12.4
Communication skills	2013/2014	29.3
	2014/2015	26.1
Soft skills, e.g., assertive attitude	2013/2014	13.0
	2014/2015	14.6
Medical knowledge, particularly in the field of the pathogenesis of diseases	2013/2014	63.6
	2014/2015	75.0

Table 12. What barriers do you recognize in the way of effective implementation of pharmaceutical care into Polish community pharmacies?

Issues	Research group	Results in %
Legal aspects	2013/2014	48.0
	2014/2015	48.3
Lack of motivation of pharmacists	2013/2014	36.0
	2014/2015	32.8
The conflict of competence between physicians and pharmacists	2013/2014	63.7
	2014/2015	53.2
Lack of time	2013/2014	53.2
	2014/2015	44.9
Different barriers	2013/2014	16.0
	2014/2015	21.0

ceutical care and the possibility of implementation new services into community pharmacies under conditions of the Polish health care system. Moreover, the undoubted advantage of this study is the short period of research; from initiation to completion of the project approximately 2 years have passed. In addition, the students of pharmacy were familiar with the fact that providing pharmaceutical care should be associated with a reliable postgraduate training or even obtaining a specialization or completing the certification process. To meet the students' concerns and doubts associated with the lack of medical knowledge, the innovative subject 'Introduction to Medicine' has been introduced in Gdańsk. Nevertheless, results of this research have a tremendous role in the discussion about the form of postgraduate pharmacists' training.

It should be highlighted that the students presented a more positive attitude to the process of implementation of new services than physicians and pharmacists (12). From worldwide perspective, studies which aimed at examining the perceptions of students about pharmaceutical care are well known and widely discussed (13-15). In line with our results based on the Polish population, a previous study showed that students from Qatar had positive attitudes toward pharmaceutical care. Moreover, all respondents from the mentioned study agreed that the pharmacist's primary responsibility is to prevent and resolve medication therapy problems (16). These results are consistent with our observations as well. Also, student pharmacists at Kuwait University understood and advocated the implementation of pharmaceutical care while also recognizing the barriers to its spread. The students identified several major barriers to the integration of pharmaceutical care with practice, e.g., lack of time (17). In addition, in another study, respondents indicated

that soft skills and enhancing communication are necessary to effective implementation of pharmaceutical care in community pharmacies (18). A similar situation is observed also in Saudi Arabia (19) or Nigeria (20). Interestingly, students from France have a very similar perspective. They recognized the process of evolution pharmacists' competencies from traditional dispensing role to more responsibilities associated with clinical management (21). Our respondents suggested that necessary to provide effective pharmaceutical care is to possess the knowledge about advanced pharmacology, pharmacotherapy, and drug interactions. American researchers suggest that it might be facilitated by practical teaching in clinical settings (22).

Limitations

First of all, this was an observational, exploratory study performed on the limited study population and area. Consequently, the respondents were young pharmacy and medicine students, and their opinions may not reflect those of pharmacists throughout Poland or EU. This is a study of students' opinions and perspective, and the results cannot be seen as a sufficient factor to prepare the reform of curriculum or change the paradigms of implementation of pharmaceutical care in community pharmacies. Last but not least, this research should be considered alongside the opinions of physicians and pharmacists. The another limitation of the study is the primary distribution of respondents among pharmacy and medicine students. The student of pharmacy represented the last stage of higher education during the community pharmacies training. The population of medicine students was more diversified. The impact of this factor on the results of the study remains unknown. The study represents a perfect beginning for further represen-

tative studies involving the professional public opinion research centers.

CONCLUSIONS

Both, students from the Faculty of Pharmacy and Medicine, supported the idea of implementing the more sophisticated role of pharmacists into routine settings of Polish community pharmacies, in light of introducing the non-medical prescribing or access to medical record for community pharmacists. However, the pharmacy students saw many obstacles to effective changing the community pharmacies settings, i.e., lack of time, lack of knowledge particularly in the field of soft skills and communication, or legal issues. It is assumed that the results will contribute to the discussion about the role of community pharmacies and pharmacists in the process of rationalization of pharmacotherapy. Furthermore, more representative studies are strongly needed to improve the development of pharmaceutical care in Poland.

Conflicts of interest

The authors declare that they have no conflicts of interest to disclose.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

REFERENCES

1. Hepler C.D., Strand L.M.: *Am. J. Hosp. Pharm.* 47, 533 (1990).
2. Berenguer B., La Casa C., de la Matta M.J., Martín-Calero M.J.: *Curr. Pharm. Des.* 10, 3931 (2004).
3. Blackburn D.F., Yakiwchuk E.M., Jorgenson D.J., Mansell K.D.: *Ann. Pharmacother.* 46, 447 (2012).
4. Al-Quteimat O.M., Amer A.M.: *Saudi Pharm. J.* (2014).
5. Calvert R.T.: *Br. J. Clin. Pharmacol.* 47, 231(1999).
6. Skowron A., Polak S., Brandys J.: *Pharm. Pract. (Granada)* 9, 110 (2011).
7. Skowron A., Bułaś L., Drozd M., Karolewicz B., Machalska J.: *Acta Pol. Pharm.* 73, 255 (2016).
8. <http://www.rynekapteki.pl/prawo/mz-czlonkowie-zespolu-ds-opieki-farmaceutycznej,10531.html> (Accessed March 22, 2016).
9. <http://www.rynekapteki.pl/marketing-i-zarzadzanie/przeglad-lekowy-bedzie-elementem-opieki-farmaceutycznej,12295.html> (Accessed March 22, 2016).
10. <http://www.klrwp.pl/aktualnosci/wpis/35/2016-03-02/stanowisko-klr-w-s-opieki-farmaceutycznej/pl> (Accessed March 22, 2016).
11. Pawłowska I., Stożkowska W.: *Farm. Pol.* 68, 737 (2012).
12. Świeczkowski D., Krysiński J., Merks P., Siluk D.: *Farm. Pol.* 72 (2016).
13. Lawrence L., Sherman J., Adams E., Gandra S.: *Am. J. Pharm. Educ.* 68, 1 (2004).
14. van Mil J.W.F., Schulz M., Tromp T.F.J.: *Pharm. World Sci.* 26, 303 (2004).
15. Abdelhalim D., Mohundro B.L., Evans J.D.: *J. Am. Pharm. Assoc.* 51, 627 (2012).
16. El Hajj M.S., Hammad A.S., Afifi H.M.: *Ther. Clin. Risk. Manag.* 10, 121 (2014).
17. Katoue M.G., Awad A.I., Schwinghammer T.L., Kombian S.B.: *Pharm. Pract.* 12, 411 (2014).
18. Scott D.M., Friesner D.L., Miller D.R.: *Am. J. Pharm. Educ.* 74, 8 (2010).
19. Al-Arifi M.N.: *Pharm. World Sci.* 31, 677 (2009).
20. Udeogaranya P.O., Ukwe C.V., Ekwunife O.I.: *Pharm. Pract.* 7, 145 (2009).
21. Perraudin C., Brion F., Bourdon O., Pelletier-Fleury N.: *BMC Clin. Pharmacol.* 11, 6 (2011).
22. Lawrence L., Sherman J., Adams E., Gandra S.: *Am. J. Pharm. Educ.* 68, 4 (2004).

Received: 12. 05. 2016