
PHYSICIANS' VALUATION OF INDIVIDUAL MEDICATION MANAGEMENT SYSTEM (IMMS) IMPLEMENTATION IN POZNAŃ (POLAND) COMMUNITY PHARMACIES

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Abstract: The reason of growing Pharmaceutical Care (PC) popularity in Poland and all over the world in recent years is connected with a new idea which separates pharmacists from a stereotype of drug store, dealing only with issuing medicines in adequate doses. There is an intention of emphasizing their qualifications and maximizing the use of them. One of the essential part of PC is preparing Individual Medication Management System (IMMS) which may provide individualized pharmacotherapy for patient. The aim of the study was to assess the physicians' opinion about implementation of IMMS in Polish community pharmacies and to evaluate physician-pharmacist cooperation. A cross sectional study was carried out from April 2013 to December 2013 by a pharmacist (authors' of the study). The survey covered 103 physicians (35.9% men and 64.1% women) providing medical services in Poznań. The respondents obtained an anonymous questionnaire with a brief information about IMMS. The results of the study confirmed that 90.3% of physicians would recommend IMMS to their patients. They believed that 72.8% of the patients would be interested in this service. According to 74.8% of doctors, especially with a specialization in cardiology, family medicine, and without specialty, IMMS might contribute to the PC development ($p < 0.0001$). The respondents (56.3%) confirmed their collaboration with at least 1 pharmacist and 79.6% declared the possibility of the cooperation by using IMMS. This study provides new data about implementation of IMMS in Poland. This innovatory service could be the chance both for patient and physicians to increase the safety and effectiveness of pharmacotherapy and for pharmacists who are intended to highlight their role as a part of health care system. The physicians' positive opinion provide the opportunity to implement IMMS in Polish community pharmacies.

Keywords: Individual Medication Management System, pharmaceutical care, pharmacist, physician

The pharmaceutical care (PC) popularity is growing permanently mainly because of the intention to change the perception of pharmacist's profession (1, 2). This new service is the direct, responsible provision of medication-related care for the purpose of achieving definite outcomes that improves a patient's quality of life (3). Increasing patient's health awareness and unlimited access to pharmacists were mostly the reason to start popularizing and implementing PC also in Poland. This situation requires from pharmacist cooperation with patients, physicians and other health care profes-

sions effectively to avoid e.g., patient's nonadherence, which is determined as the number of doses not taken or taken incorrectly that jeopardizes the patient's therapeutic outcome (4). Many studies confirm that mostly people with chronic diseases don't follow up the physician guidelines, which generate increased mortality rate (5).

Individual Medication Management System (IMMS) is one of the proposals to resolve this problem. It is an example of a disposable, blister pack system for dosing solid drugs which is divided into special compartments intended for specific time of

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Table 1. Physicians' frequency distribution of the study.

	Frequency (n)	Percentage (%)
Age (years)		
Under 35	21	20.4
35-64	68	66.0
65+	14	13.6
Total	103	100.0
Scientific/Professional degree		
MD	95	92.2
PhD	7	6.8
Prof.	1	1.0
Total	103	100.0
Length of service as a physician		
Under 5 years	15	14.6
5-20 years	33	32.0
Over 20 years	55	53.4
Total	103	100.0
Gender/sex		
Male	37	35.9
Female	66	64.1
Total	103	100.0
Specialty		
Family medicine	12	11.7
Diabetology	13	12.6
Cardiology	17	16.5
Others:	44	42.7
Pediatrics	7	6.8
General surgery	6	5.8
Ophthalmology	6	5.8
Obstetrics and gynecology	6	5.8
Dermatology and venereology	5	4.9
Orthopedics and traumatology	5	4.9
Otolaryngology	5	4.9
Urology	4	3.8
No specialty	17	16.5
Total	103	100.0

the day, on particular days of the week. This has a positive effect on dosing scheme and it helps to eliminate the risk of errors. IMMS is prepared by a pharmacist who is obliged to verify dosing scheme propriety, check relevant doses and eliminate possible drugs interactions. Moreover, a pharmacist is obliged to attach information about the way of tak-

ing prepared drugs, possible adverse drug reactions (ADR), and the course of action in case of its occurrence. IMMS is mostly directed for patients with multiple-drug treatment, old aged people, and patients who are treated by many physicians (6).

It is confirmed that IMMS improves patient's adherence. The best results are generated when

health care practitioners cooperate with each other. Completed patient's documentation, gathered information about the disease and taken drugs are the best proposition to resolve pharmacotherapy problems. Besides, different views of specialists are very valuable to obtain the best patient's drug therapy (7, 8). The limitation in practical application concerns patient who intentionally ignores prescribed pharmacotherapy. It may reduce nonadherence but very often professional psychological advice is needed first. IMMS is intended for solid and oral drugs not for effervescent or sublingual tablets. There is also potential possibility of interaction between drug and blister (9, 10).

The aim of the study was to assess the physicians' opinion about implementation of IMMS as an important part of PC in Polish community pharmacies and to evaluate physician-pharmacist cooperation. The study defined also whether IMMS could improve doctors' and pharmacists' cooperation to get proper pharmacotherapy. The data assumed analysis for gender, specialty, scientific/professional degree and length of service as a physician.

MATERIAL AND METHOD

The survey as a cross sectional study was carried out from April 2013 to December 2013 by a pharmacist (authors' of the study). It covered 103 physicians (35.9% men and 64.1% women) providing medical services in Poznań. Each anonymous questionnaire was supplied with a short information brochure about IMMS and was filled in by the physician. The most numerous group of respondents consisted of physicians aged from 35 to 64 years old

(66.0%) and with over 20 years length of service as a physician (53.4%). The other age groups were: under 35 – 20.4%, 65 years and more – 13.6%. In terms of the length of service as a physician the remaining groups were: under 5 years – 14.6%, 5–20 years – 32.0%. The majority of the responding participants had no scientific degree (92.2%) and 16.5% of the physicians did not have specialty. Among the respondents 16.5% were cardiologists, 11.7% of them were family medicine doctors and 12.6% were diabetologists. The rest of the specializations were joined together as a group named "physicians of other specialties". Socio-economic data included information about age, sex, specialty, professional/scientific degree and length of service of physician and are presented in Table 1. The study was approved by the ethics review board of Poznan University of Medical Sciences.

The results were statistically analyzed with the use of Statistica 10.0 application (StatSoft®). The relationship between analyzed nominal data was performed by χ^2 test of independence. In case when observed frequencies were low or zero the Fisher-Freeman-Halton exact test was used. All statistical analyses were performed at $p < 0.05$.

RESULTS

The study confirmed that 39.8% questioned, mainly the physicians who specialize in family medicine, ordered their patients the classic dispensers for solid drugs during their everyday practice (Table 2; $p = 0.0353$) and 90.3% of them would recommend the use of IMMS to patients in the future (Fig. 1) They believed that 72.8% of the patients would be interest-

Table 2. Physicians' opinion concerning recommending drug dispensers to their patients and about IMMS contribution to PC development and their specialty.

	Specialty					Total	p-value
	Family medicine	Diabetology	Cardiology	Others	No specialty		
<i>Recommending classic dispensers for patients</i>							
yes n (%)	8(66.7)	4(30.8)	3(17.6)	6(36.4)	10(58.8)	41(39.8)	0.0353*
no n (%)	4(33.3)	9(60.2)	14(82.4)	28(63.6)	7(41.2)	62(60.2)	
<i>IMMS contributing to PC development</i>							
yes n (%)	10(83.3)	4(30.8)	12(70.6)	35(79.5)	16(94.1)	77(74.8)	
no n (%)	0(0.0)	1(7.7)	0(0.0)	5(11.4)	0(0.0)	6(5.8)	< 0.0001*
no opinion n (%)	2(16.7)	8(61.5)	5(29.4)	4(9.1)	1(5.9)	20(19.4)	

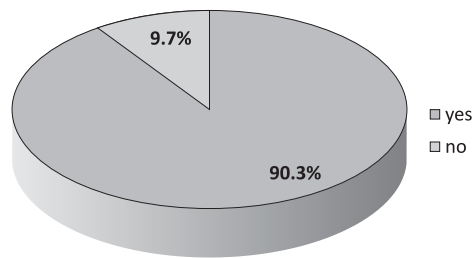


Figure 1. Physicians' opinion concerning the possibility of recommending the use of IMMS to patients, n = 103

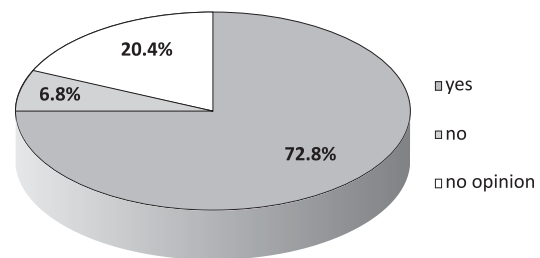


Figure 2. Physicians' opinion concerning patients' interest in using IMMS, n = 103

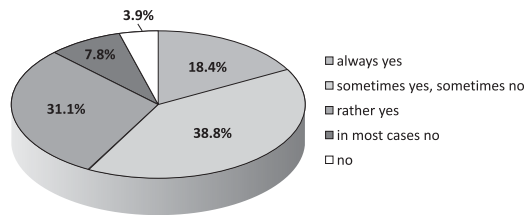


Figure 3. Physicians' opinion about patients' willingness to pay for IMMS, n = 103

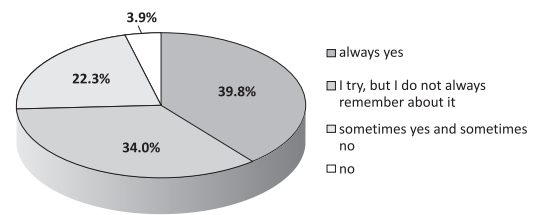


Figure 4. Physicians' opinion concerning paying for IMMS, n = 103

ed in this service (Fig. 2) and that 35.0% of them would pay for it (Fig. 3). The doctors were of opinion that this service should be refunded (43.7%), or paid (37.9%) by the patients (Fig. 4). According to 74.8% of doctors, especially with a specialization in cardiology, family medicine, and without specialty, IMMS might contribute to the development of the PC ($p < 0.0001$). The results are presented in Table 2.

The respondents (56.3%) assessed their collaboration with at least 1 pharmacist (Fig. 5), 79.6% of the participants noticed the possibility of cooperation between physician and pharmacist in order to improve the effectiveness and safety of patient's pharmacotherapy by IMMS (Fig. 6).

Unfortunately, only 18.4% of the respondents indicated that they always have enough time to educate patients about their diseases properly. The physicians (38.8%) responded that sometimes they have enough time to give proper information to the patient. Some doctors (7.8%) states that in most cases they didn't educate their patient's (Fig. 7). Only 39.8% of the physicians claimed that, while prescribing drugs they took into consideration all the medications taken by a patient (Fig. 8). What is more, 70.9% of the physicians noticed the problem of not obeying doctor's recommendations regarding the rules of taking drugs (Fig. 9).

Additional gender, specialty, scientific/professional degree analysis didn't achieve the level of statistical significance.

DISCUSSION AND CONCLUSION

The study confirmed popularity of classic dispensers among physicians and great interest in IMMS. In the opinion of the physicians, this system will be valuable for many patients. In many studies, it is proved that IMMS is better than classic dispenser because it is prepared by the specialist. Pharmacist's knowledge and experience lead to decreasing errors which can occur when patient prepare drug scheme alone. Moreover, pharmacist analyzes patient's pharmacotherapy and can resolve drug problems during providing pharmaceutical care. It is verified that IMMS eliminates polypharmacy, provides proper doses of the drugs and indicates adverse drug reactions (11-13).

According to physicians opinion, IMMS should be refunded or paid by the patient. This new service is a valuable idea for government, insurers and health care team, because of its economical consideration. There are many studies which assess that patient's non-adherence leads to: extension of the length or failure of treatment, more severe course of a disease, the necessity of hospitalization, or even death. In the United States of America it is explored that these are very high valuation, precisely 2.5% of national health funds. Unfortunately, in Poland it is even much higher, precisely 10% of National Health Fund budget (5, 15, 16).

So, it is very important to get a proper cooperation between physician and pharmacist. In this

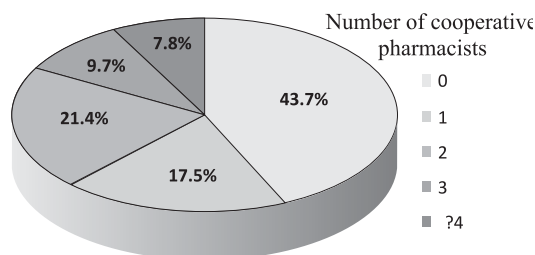


Figure 5. Physicians' opinion concerning cooperation with pharmacists, n = 103

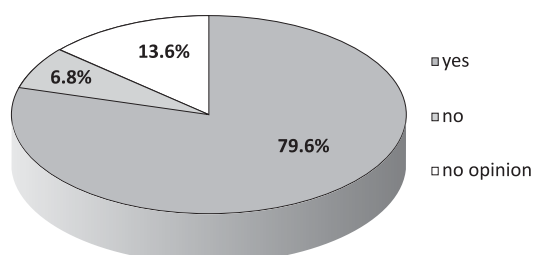


Figure 6. Physicians' opinion concerning partnership with pharmacists' widen by IMMS application, n = 103

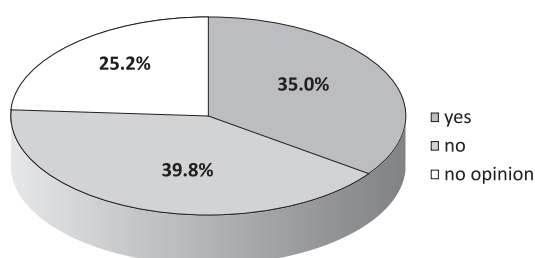


Figure 7. Physicians' opinion concerning having time to educate patients, n = 103

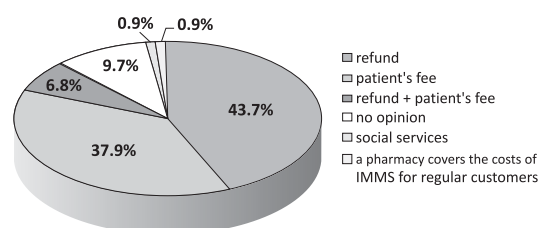


Figure 8. Physicians' opinion concerning taking into consideration all of the medications being taken by patients while prescribing drugs, n = 103

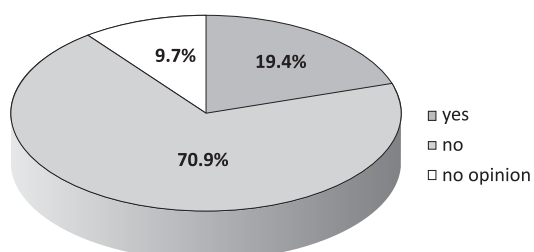


Figure 9. Physicians' opinion concerning patients' following doctors' recommendations, connected with instructions about the rules of taking drugs, n = 103

study, it turns out that about half of the responding physicians were cooperating with pharmacist. In the study from 2012, 35.2% of pharmacists were collaborating with the physicians (16). In many countries, where participants of health care team work together and share experiences from different specialties, it brings a lot of advantages for patients' pharmacotherapy (17-19). It is also very important, especially in the situation when the physician very often do not have enough time for the patient's education. It can lead to many complications connected with e.g., wrong drug application or improper dosage. Many studies describe poor patients education, which should be improved because of its importance

in specific pharmacotherapy scheme, especially in chronic diseases (20, 21). IMMS could be the opportunity both for physicians and pharmacist to provide adequate patients' pharmacotherapy. It can have also a positive influence on the improvement of pharmacist-physician partnership. The growing interest in cooperation can lead to more effective informations about patients' health condition and their pharmacotherapy. As a result, it would have an impact on the safety of therapy.

Unfortunately, only some of the physicians take always into consideration all of the medications being taken by patients, while prescribing drugs. This is the factor which increases the opportunity of drugs interaction occurrence, also with OTC medicines. Moreover, it can lead to a situation, when a patient takes more than one drug that magnifies the same side effects or overdose medicine by taking more than one preparation with similar properties. Very often, patient takes the same generic and name-brand drug at the same time, so that it is suitable to check the patient's medication e.g., by IMMS service (22, 23).

IMMS is a new idea to achieve a better patients' pharmacotherapy. It gives a lot of advantages not only for the patient but also for physician-pharmacist cooperation which is valuable in pharmacological treatment. As an innovative idea it may

improve patient's compliance in pharmaceutical care process.

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