

PART III. OTHER

DZIAŁ III. RÓŻNE

PHYSICIANS-IN-TRAINING ATTITUDES TOWARDS THE COMMUNITY PHARMACIST-
PHYSICIAN COLLABORATION AND PHARMACEUTICAL CARE: A 2022 CROSS-
SECTIONAL SURVEY IN POLAND

POSTAWY SZKOŁĄCYCH SIĘ LEKARZY WOBEC WSPÓŁPRACY FARMACEUTY
Z LEKARZEM I OPIEKI FARMACEUTYCZNEJ: BADANIE PRZEKROJOWE W POLSCE
W 2022 ROKU

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Summary

Background. The World Health Organization (WHO) encourages collaboration among healthcare professionals. Due to the aging of the population and the burden of chronic diseases, there is a need to implement effective pharmaceutical care in Poland. This study aimed to characterize attitudes towards community pharmacist-physician collaboration and pharmaceutical care among physicians-in-training in Poland.

Material and methods. This cross-sectional survey was conducted among 509 doctors undergoing specialization training in the fourth quarter of 2022. The study questionnaire included 18 questions on community pharmacist-physician collaborative working and pharmaceutical care.

Results. In the group of respondents, 94.1% agreed that there is a need for the physician-pharmacist collaboration in pharmaceutical care. Among the respondents, 77.2% declared a lack of knowledge of the pharmacists' responsibilities under Polish law, and 79.6% declared that the current education programs do not prepare physicians for cooperation with pharmacists and pharmaceutical care. Most of the physicians declared that pharmacists should provide patient education on the use of medical equipment (92.5%), detection of drug-dietary supplements interactions (85.9%), and detection of polypharmacy (85.7%). Lack of IT systems supporting collaborative working and pharmaceutical care (69.5%) was the most common barrier to collaboration with physicians.

Conclusions. The study showed that current cooperation between physicians and community pharmacists is limited to formal issues. Building cooperation between physicians and pharmacists must start at the education stage. The implementation of pharmaceutical care should start with the cooperation of primary care physicians and community pharmacists from community pharmacies.

Keywords: pharmaceutical care, Poland, pharmacists, collaboration, physicians

Streszczenie

Wprowadzenie. Światowa Organizacja Zdrowia (WHO) zachęca do współpracy między pracownikami służby zdrowia. Ze względu na starzenie się społeczeństwa i obciążenie chorobami przewlekłymi, istnieje potrzeba wdrożenia skutecznej opieki farmaceutycznej w Polsce. Niniejsze badania miały na celu scharakteryzowanie postaw wobec współpracy farmaceuty i lekarza środowiskowego oraz opieki farmaceutycznej wśród lekarzy stażystów w Polsce.

Materiał i metody. Badania przekrojowe przeprowadzono wśród 509 lekarzy odbywających szkolenie specjalizacyjne w czwartym kwartale 2022 roku. Kwestionariusz badania zawierał 18 pytań dotyczących współpracy farmaceuty z lekarzem i opieki farmaceutycznej.

Wyniki. W grupie respondentów, 94,1% zgodziło się, że istnieje potrzeba współpracy lekarza i farmaceuty oraz wdrożenia opieki farmaceutycznej. Wśród badanych, 77,2% zadeklarowało brak wiedzy na temat obowiązków farmaceutów wynikających z polskiego prawa, a 79,6% stwierdziło, że obecne programy kształcenia nie przygotowują lekarzy do współpracy z farmaceutami i opieki farmaceutycznej. Większość lekarzy zadeklarowała, że farmaceuci powinni prowadzić edukację pacjentów w zakresie korzystania ze sprzętu medycznego (92,5%), wykrywania interakcji leków z suplementami diety (85,9%) oraz wykrywania polifarmacji (85,7%). Brak systemów informatycznych wspierających współpracę i opiekę farmaceutyczną (69,5%) był najczęstszą barierą we współpracy z lekarzami.

Wnioski. Badania wykazały, że obecna współpraca pomiędzy lekarzami i farmaceutami jest ograniczona do kwestii formalnych. Budowanie współpracy pomiędzy lekarzami i farmaceutami musi rozpocząć się na etapie edukacji. Wdrażanie opieki farmaceutycznej powinno rozpocząć się od współpracy lekarzy podstawowej opieki zdrowotnej i farmaceutów z aptek ogólnodostępnych.

Słowa kluczowe: opieka farmaceutyczna, Polska, farmaceuci, współpraca, lekarze

Tables: 5

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Submitted: 2023 Oct 16

Accepted: 2023 Nov 17

Published Online: 2023 Dec 11

Wrześniewska-Wal I, Pinkas J, Jankowski M. Physicians-in-training attitudes towards the community pharmacist-physician collaboration and pharmaceutical care: a 2022 cross-sectional survey in Poland. Health Prob Civil. 2024; 18(1): 94-107. <https://doi.org/10.5114/hpc.2023.133085>

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Introduction

The World Health Organization (WHO) encourages collaboration among healthcare professionals. This approach can be used to build strong and safe health care systems that guarantee patients access to quality health services, reduce errors, and reduce health care costs [1]. The concept of collaboration among healthcare professionals comes from Lowell T. Coggeshall, who wrote in his report almost half a century ago, that the idea of medicine as a discipline used to treat one sick person should be replaced by interdisciplinary collaboration to improve and maintain the health not only of one patient, but of the entire society [2]. Elements of interprofessional collaboration include responsibility, coordination, communication, assertiveness, autonomy, and mutual trust and respect. It is this partnership that creates an interdisciplinary team to work towards common goals to improve patient outcomes [3-4].

In Poland, doctor-pharmacist cooperation is an area that requires special attention, because we are the last country in Europe to implement pharmaceutical care [5].

Despite their shared history and ethical values, there are many differences between the medical and pharmacist professions that impact patient care [6]. Currently, pharmacists and doctors are prepared to provide joint patient care. Furthermore, under the new Pharmacist Profession Act, as of 2020, pharmacists are legally obliged to provide pharmaceutical care to their patients, thus fulfilling a more patient-centric role than their traditional role of “dispensing medicines” [7].

Optimal pharmaceutical care is key to achieving therapeutic goals. To ensure this, interdisciplinary cooperation between doctors and pharmacists and/or other medical professionals is necessary [8]. Their specialized and complementary knowledge and professional experience can lead to improved patient health outcomes and may also reduce treatment costs [4].

Despite abundant evidence of the positive impact of community pharmacists on health care, in Poland, cooperation between pharmacists and doctors is often limited [7]. The COVID-19 pandemic has contributed to a change in the perception of the role of a pharmacist in the health care system [9], but these favorable circumstances have not been properly used. Pharmacists, although well trained, remain an untapped health care resource. Interdisciplinary teamwork for patients with the participation of pharmacists should be the norm in all healthcare facilities (pharmacies and clinics).

Aim of the work

This study aimed to characterize attitudes towards community pharmacist-physician collaboration and pharmaceutical care among physicians-in-training in Poland.

Material and methods

Subjects

This cross-sectional survey was conducted among physicians-in-training participating in postgraduate training courses at the School of Public Health, Center of Postgraduate Medical Education, Warsaw, Poland. Physicians undertaking specialty training in Poland are required to attend training courses on public health and medical law [10]. All 1,067 physicians attending these courses between October and December 2022 were eligible to take part in the survey. The participants represented over 40 medical specialties and different administrative regions over the country. Each participant received a link to the research questionnaire available via Google Forms. Participation in the study was voluntary and anonymous. Each participant declared informed consent before the study. The study protocol was approved by the Ethical Reviewer Board at the Center of Postgraduate Medical Education (consent number: 128/2022).

Measures

The study tool was a self-prepared questionnaire on community pharmacist-physician collaborative working and pharmaceutical care. The questionnaire was prepared based on a literature review [8,11-14] The study questionnaire included 18 questions on community pharmacist-physician collaborative working and pharmaceutical care. The questionnaire was divided into three sections: the current state of collaborative working, expectations towards collaborative working, and barriers in the widespread implementation of community pharmacist-physician collaborative working and pharmaceutical care in Poland. Questions on sociodemographic characteristics (gender, age, medical education level (having at least one specialization or undergoing first specialty training), place of primary employment, type of primary employment, and location of primary employment) were also addressed.

Statistical analysis

Data were analyzed with SPSS software v. 28 (IBM, Armon, NY, USA). Data were presented with frequencies and proportions. Cross-tabulations and chi-square tests were used to compare categorical variables. The statistical significance level was set at $p < 0.05$.

Results

Characteristics of the study population

Completed questionnaires were received from 509 physicians, with a response rate of 32.7%. The mean age was 32.4 ± 6.2 , median of 30 years (Table 1). Most of the respondents were female (62.7%). All respondents were physicians-in-training, but 22% had completed at least one specialization training in the past. Among the respondents, 81.1% indicated a hospital as a place of primary employment, and 88.6% indicated public medical facilities as a place of primary employment. Almost one-third of respondents (31%) worked in primary care (as a primary or additional place of employment).

Table 1. Characteristics of the study population (n=509)

Characteristics	n	%
Gender		
female	319	62.7
male	190	37.3
Age		
mean \pm SD	32.4 \pm 6.2	
Medical education level		
residency (physician-in-training)	397	78.0
specialist	112	22.0
Place of primary employment (practice type)		
hospital	413	81.1
ambulatory care	96	18.9
Type of primary employment		
public institution	451	88.6
private institution	58	11.4

Characteristics	n	%
Location of primary employment		
rural area	11	2.2
city up to 100,000 residents	107	21.0
city from 100,000 to 500,000 residents	144	28.3
city above 500,000 residents	247	48.5
Working in primary care		
yes	158	31.0
no	351	69.0

Physicians' expectations towards the physician-pharmacist collaboration and pharmaceutical care

Most of the respondents agreed (94.1%) that there is a need for physician-pharmacist collaboration and implementation of pharmaceutical care, and 89.2% believed that pharmacists can help the physicians in pharmacotherapy management (Table 2). Among the respondents, 77.2% declared a lack of knowledge of the responsibilities that community pharmacists have under Polish law; 38% of physicians declared that physicians and pharmacists trust each other and rely on their professional abilities; 79.6% declared that current medical education programs do not prepare physicians for pharmacist-physician collaborative working and pharmaceutical care.

Formal correction of the prescription was the most common reason for collaboration between physicians and pharmacists (75.6%), and approximately one-tenth of respondents declared that they currently collaborate with community pharmacists on reporting drug interactions and polypharmacy (10.2%) or drug review (9%).

Most of the physicians declared that patient education on the use of medical equipment (92.5%), detection of drugs-dietary supplements interactions (85.9%), and detection of polypharmacy (85.7%) were the pharmaceutical care services that can be provided by the community pharmacist (Table 2). Lack of IT systems supporting collaborative working and pharmaceutical care (69.5%), lack of medical education (65.2%), and lack of recommendations on community pharmacist-physician collaborative working were the most common barriers to collaboration with physicians (Table 2).

Table 2. Physicians' expectations towards the physician-pharmacist collaboration and pharmaceutical care (n=509)

Variable	Physicians n=509	
	n	%
There is a need for physician-pharmacist collaboration and implementation of pharmaceutical care		
strongly agree	317	62.3
rather agree	162	31.8
rather disagree	13	2.6
strongly disagree	7	1.4
I do not know	10	2.0
Pharmacists can help physicians in pharmacotherapy management		
strongly agree	240	47.2
rather agree	214	42.0
rather disagree	27	5.3
strongly disagree	9	1.8
I do not know	19	3.7

Variable	Physicians n=509	
	n	%
Do physicians understand the responsibilities that community pharmacists have under Polish law?		
yes	49	9.6
no	393	77.2
I do not know	67	13.2
Do physicians and pharmacists trust each other and rely on their professional abilities?		
definitely yes	11	2.2
rather yes	182	35.8
rather no	150	29.5
definitely no	18	3.5
I do not know/difficult to tell	148	29.1
Do the current medical education programs prepare physicians for pharmacist-physician collaborative working and pharmaceutical care?		
definitely yes	22	4.3
rather yes	34	6.7
rather no	233	45.8
definitely no	182	33.8
I do not know	48	9.4
Do current legal regulations allow pharmacists and physicians to work collaboratively and provide pharmaceutical care?		
definitely yes	23	4.5
rather yes	122	24.0
rather no	197	38.7
definitely no	62	12.2
I do not know	105	20.6
In what situations do you currently collaborate with community pharmacists?		
formal correction of the prescription (e.g., dosage, formulation)	385	75.6
modification of ordered drugs (e.g., dosage, formulation, drug availability)	188	36.9
support in ordering formulated medicines	162	31.8
reporting drug interactions and polypharmacy	52	10.2
drug review	46	9.0
What pharmaceutical care services can be provided by the community pharmacist?		
patient education on the use of medical equipment (e.g., glucometer, nebulizer)	471	92.5
counseling on lifestyle changes in non-communicable chronic diseases	339	66.6
pharmacotherapy and adherence monitoring	244	47.9
pharmacotherapy and compliance monitoring	269	52.8
pharmaceutical counseling for minor health problems	199	39.1
detection of polypharmacy	436	85.7
detection of drugs-dietary supplements interactions	437	85.9
detection of a prescribing cascade	297	58.3
Major barriers to collaboration with pharmacists		
lack of guidelines on community pharmacist-physician collaborative working	296	58.2
limited time	251	49.3
lack of IT systems supporting collaborative working and pharmaceutical care	354	69.5
lack of public funding	74	14.5
lack of medical education on physician-pharmacist collaboration and pharmaceutical care	332	65.2
other barriers	3	0.6

Sociodemographic differences in physicians' expectations towards the implementation of physician-pharmacist collaboration and pharmaceutical care

Physicians who had completed at least one specialty training (83% vs. 73.6%; $p=0.04$), as well as those working in private institutions (87.9% vs. 74.1%; $p=0.02$), more often declared that they collaborated with community pharmacists during the formal correction of the prescription (Table 3). Physicians working in primary care more often declared (44.9% vs. 33.3%; $p=0.01$) that they collaborated with community pharmacists to modify ordered drugs (Table 3).

Females more often indicated that pharmacists can be involved in patient education (94.7% vs. 88.9%; $p=0.02$). Physicians who indicated hospitals as a place of primary employment, compared with those working in ambulatory care, more often indicated that pharmacists can be involved in counseling on lifestyle changes (69.0% vs. 56.3%; $p=0.02$) and services related to polypharmacy detection (87.2% vs. 79.2%; $p=0.04$). Physicians working in primary care more often indicated that pharmacists may offer pharmaceutical counseling for minor health problems (45.6% vs. 36.2%; $p=0.04$). Moreover, physicians working in public institutions more often indicated that pharmacists may offer services related to polypharmacy detection (87.8% vs. 69.0%; $p=0.001$). Details are presented in Table 4.

Males more often indicated limited time (57.4% vs. 44.5%; $p=0.01$) as a major barrier to collaboration with pharmacists (Table 5). Females (74.6% vs. 61.1%; $p=0.001$) more often indicated a lack of IT systems as a barrier to collaboration with pharmacists. Physicians who indicated ambulatory care as a primary place of employment more often indicated a lack of public funding for pharmacist-physician collaborative working and pharmaceutical care as a major barrier to collaboration with pharmacists (21.9% vs. 12.8%; $p=0.02$). Physicians who did not work in primary care more often indicated a lack of medical education on physician-pharmacist collaboration and pharmaceutical care (68.4% vs. 58.2%; $p=0.03$) as a major barrier to collaboration with pharmacists (Table 5).

Table 3. The current state of community pharmacist-physician collaborative working and pharmaceutical care: physicians' perspective (n=509)

Variable	In what situations do you currently collaborate with community pharmacists?											
	Formal correction of the prescription		Modification of ordered drugs		Support in ordering formulated medicines		Reporting drug interactions and polypharmacy		Pharmacist drug review			
	n (%)	p	n (%)	p	n (%)	p	n (%)	p	n (%)	p		
Gender												
female	249 (78.1)	0.1	126 (39.5)	0.1	104 (32.6)	0.6	26 (8.2)	0.04	25 (7.8)	0.2		
male	136 (71.6)	-	62 (32.6)	-	58 (30.5)	-	26 (13.7)	-	21 (11.1)	-		
Age												
<35	282 (73.4)	0.1	140 (36.5)	0.3	120 (31.3)	0.9	38 (9.9)	0.8	38 (9.9)	0.2		
35-45	77 (83.7)	-	39 (42.4)	-	31 (33.7)	-	11 (12.0)	-	8 (8.7)	-		
45 and over	26 (78.8)	-	9 (27.3)	-	11 (33.3)	-	3 (9.1)	-	0 (0.0)	-		
Medical education level												
residency (physician-in-training)	292 (73.6)	0.04	141 (35.5)	0.2	120 (30.2)	0.1	38 (9.6)	0.4	35 (8.8)	0.7		
specialist	93 (83.0)	-	47 (42.0)	-	42 (37.5)	-	14 (12.5)	-	11 (9.8)	-		
Place of primary employment (practice type)												
hospital	299 (72.4)	<0.001	148 (35.8)	0.3	134 (32.4)	0.5	44 (10.7)	0.5	42 (10.2)	0.07		
ambulatory care	86 (89.6)	-	40 (41.7)	-	28 (29.2)	-	8 (8.3)	-	4 (4.2)	-		
Type of primary employment												
public institution	334 (74.1)	0.02	166 (36.8)	0.9	145 (32.2)	0.7	46 (10.2)	0.9	42 (9.3)	0.5		
private institution	51 (87.9)	-	22 (37.9)	-	17 (29.3)	-	6 (10.3)	-	4 (6.9)	-		
Location of primary employment												
rural area	9 (81.8)	0.5	6 (54.5)	0.1	4 (36.4)	0.5	0 (0.0)	0.2	0 (0.0)	0.7		
city up to 100,000 residents	86 (80.4)	-	38 (35.5)	-	28 (26.2)	-	12 (11.2)	-	9 (8.4)	-		
city from 100,000 to 500,000 residents	105 (72.9)	-	62 (43.1)	-	51 (35.4)	-	20 (13.9)	-	13 (9.0)	-		
city above 500,000 residents	185 (74.9)	-	82 (33.2)	-	79 (32.0)	-	20 (8.1)	-	24 (9.7)	-		
Working in primary care												
yes	128 (81.0)	0.06	71 (44.9)	0.01	46 (29.1)	0.4	18 (11.4)	0.6	12 (7.6)	0.4		
no	257 (73.2)	-	117 (33.3)	-	116 (33.0)	-	34 (9.7)	-	34 (9.7)	-		

Table 4. Physicians' attitudes towards the pharmaceutical care services that may be provided by community pharmacists (n=509).

Variable	What pharmaceutical care services can be provided by the community pharmacist?													
	Patient education		Counseling on lifestyle changes		Pharmacotherapy and adherence monitoring		Pharmaceutical counseling for minor health problems		Detection of polypharmacy		Detection of drugs-dietary supplements interactions		Detection of a prescribing cascade	
	n (%)	p	n (%)	p	n (%)	p	n (%)	p	n (%)	p	n (%)	p	n (%)	p
Gender														
female	302 (94.7)	0.02	218 (68.3)	0.3	146 (45.8)	0.2	130 (40.8)	0.3	275 (86.2)	0.6	277 (86.8)	0.4	186 (58.3)	0.9
male	169 (88.9)	-	121 (63.7)	-	98 (51.6)	-	69 (36.3)	-	161 (84.7)	-	160 (84.2)	-	111 (58.4)	-
Age														
<35	351 (91.4)	0.2	248 (64.6)	0.2	179 (46.6)	0.4	142 (37.0)	0.2	334 (87.0)	0.2	337 (87.8)	0.1	227 (59.1)	0.5
35-45	88 (95.7)	-	67 (72.8)	-	46 (50.0)	-	40 (43.5)	-	77 (83.7)	-	74 (80.4)	-	54 (58.7)	-
45 and over	32 (97.0)	-	24 (72.7)	-	19 (57.6)	-	17 (51.5)	-	25 (75.8)	-	26 (78.8)	-	16 (48.5)	-
Medical education level														
residency (physician-in-training)	364 (91.7)	0.2	257 (64.7)	0.1	186 (46.9)	0.4	151 (38.0)	0.4	338 (85.1)	0.5	341 (85.9)	0.9	233 (58.7)	0.8
specialist	107 (95.5)	-	82 (73.2)	-	58 (51.8)	-	48 (42.9)	-	98 (87.5)	-	96 (85.7)	-	64 (57.1)	-
Place of primary employment (practice type)														
hospital	384 (93.0)	0.4	285 (69.0)	0.02	200 (48.4)	0.6	160 (38.7)	0.7	360 (87.2)	0.04	353 (85.5)	0.6	244 (59.1)	0.5
ambulatory care	87 (90.6)	-	54 (56.3)	-	44 (45.8)	-	39 (40.6)	-	76 (79.2)	-	84 (87.5)	-	53 (55.2)	-
Type of primary employment														
public institution	419 (92.9)	0.4	301 (66.7)	0.9	212 (47.0)	0.2	174 (38.6)	0.5	396 (87.8)	0.001	389 (86.3)	0.5	263 (58.3)	0.9
private institution	52 (89.7)	-	38 (65.5)	-	32 (55.2)	-	25 (43.1)	-	40 (69.0)	-	48 (82.8)	-	34 (58.6)	-
Location of primary employment														
rural area	11 (100.0)	0.4	7 (63.6)	0.7	6 (54.5)	0.7	3 (27.3)	0.5	7 (63.6)	0.2	11 (100.0)	0.6	5 (45.5)	0.7
city up to 100,000 residents	98 (91.6)	-	76 (71.0)	-	47 (43.9)	-	48 (44.9)	-	92 (86.0)	-	93 (86.9)	-	59 (55.1)	-
city from 100,000 to 500,000 residents	137 (95.1)	-	95 (66.0)	-	68 (47.2)	-	56 (38.9)	-	123 (85.4)	-	122 (84.7)	-	87 (60.4)	-
city above 500,000 residents	225 (91.1)	-	161 (65.2)	-	123 (49.8)	-	92 (37.2)	-	214 (86.6)	-	211 (85.4)	-	146 (59.1)	-
Working in primary care														
yes	149 (94.3)	0.3	102 (64.6)	0.5	72 (45.6)	0.5	72 (45.6)	0.04	139 (88.0)	0.3	141 (89.2)	0.1	84 (53.2)	0.1
no	322 (91.7)	-	237 (67.5)	-	172 (49.0)	-	127 (36.2)	-	297 (84.6)	-	296 (84.3)	-	213 (60.7)	-

Table 5. Major barriers to the implementation of community pharmacist-physician collaborative working and pharmaceutical care

Variable	Major barriers to collaboration with pharmacists									
	Lack of guidelines on cooperation between pharmacists and physicians		Limited time		Lack of IT systems supporting collaborative working and pharmaceutical care		Lack of public funding		Lack of medical education on physician-pharmacist collaboration and pharmaceutical care	
	n (%)	p	n (%)	p	n (%)	p	n (%)	p	n (%)	p
Gender										
female	190 (59.6)	0.4	142 (44.5)	0.01	238 (74.6)	0.001	42 (13.2)	0.3	211 (66.1)	0.6
male	106 (55.8)	-	109 (57.4)	-	116 (61.1)	-	32 (16.8)	-	121 (63.7)	-
Age										
<35	229 (59.6)	0.4	183 (47.7)	0.3	270 (70.3)	0.8	55 (14.3)	0.8	244 (63.5)	0.3
35-45	48 (52.2)	-	52 (56.5)	-	61 (66.3)	-	15 (16.3)	-	63 (68.5)	-
45 and over	19 (57.6)	-	16 (48.5)	-	23 (69.7)	-	4 (12.1)	-	25 (75.8)	-
Medical education level										
residency (physician-in-training)	238 (59.9)	0.1	192 (48.4)	0.4	275 (69.3)	0.8	57 (14.4)	0.8	257 (64.7)	0.7
specialist	58 (51.8)	-	59 (52.7)	-	79 (70.5)	-	17 (15.2)	-	75 (67.0)	-
Place of primary employment (practice type)										
hospital	244 (59.1)	0.4	204 (49.4)	0.9	288 (69.7)	0.9	53 (12.8)	0.02	277 (67.1)	0.07
ambulatory care	52 (54.2)	-	47 (49.0)	-	66 (68.8)	-	21 (21.9)	-	55 (57.3)	-
Type of primary employment										
public institution	258 (57.2)	0.2	228 (50.6)	0.1	315 (69.8)	0.7	64 (14.2)	0.5	291 (64.5)	0.4
private institution	193 (42.8)	-	23 (39.7)	-	39 (67.2)	-	10 (17.2)	-	41 (70.7)	-
Location of primary employment										
rural area	5 (45.5)	0.7	7 (63.6)	0.3	9 (81.8)	0.6	1 (9.1)	0.7	7 (63.6)	0.06
city up to 100,000 residents	61 (57.0)	-	60 (56.1)	-	70 (65.4)	-	18 (16.8)	-	74 (69.2)	-
city from 100,000 to 500,000 residents	88 (61.1)	-	66 (45.8)	-	99 (68.8)	-	18 (12.5)	-	104 (72.2)	-
city above 500,000 residents	142 (57.5)	-	118 (47.8)	-	176 (71.3)	-	37 (15.0)	-	147 (59.5)	-
Working in primary care										
yes	92 (58.2)	0.9	76 (48.1)	0.7	113 (71.5)	0.5	23 (14.6)	0.9	92 (58.2)	0.03
no	204 (58.1)	-	175 (49.9)	-	241 (68.7)	-	51 (14.5)	-	240 (68.4)	-

Discussion

The presented study shows three areas of cooperation between doctors undergoing specialist training and community pharmacists: their current cooperation, barriers, and expectations. The results indicate that currently as many as 94.1% of doctors see a clear need to cooperate with pharmacists and the need to implement pharmaceutical care. This is related to the heavy workload of Polish doctors, especially in primary care. Compared with doctors from other European countries, they have a much larger number of visits, which leads to the need to shorten the consultations' time [15].

However, it is difficult to develop this cooperation if 77.2% of doctors undergoing specialist training admit that they do not know the competences of pharmacists under the Act on the Pharmacist's Profession [16], and as many as 13.2% have no opinion on this subject. Doctors don't know what to expect from pharmacists, and the changes are fundamental. The new Act on the Profession of Pharmacist divides the areas of professional activity of a pharmacist into four categories, i.e., providing pharmaceutical care, providing pharmaceutical services, performing specific professional tasks, and performing other activities [16].

The period of specialization training of doctors is the best time for the doctor to obtain information about the pharmacist's competences. Research from the state of California shows that interprofessional collaboration should start in college. Lectures on the use of drugs given by pharmacy students filled the knowledge gaps of medical students, nurses and physician assistants, resident physicians and other medical workers [17], and at the same time showed that cooperation between professions is mutually beneficial [18]. Meanwhile, the presented study shows that as many as 79.6% of doctors undergoing specialization training stated that current education programs do not prepare doctors for cooperation with pharmacists and pharmaceutical care.

Analyzes from Germany show that the most effective form of shaping this cooperation is joint learning between students of various medical faculties at the patient's bedside or case studies [19]. As many as 65.2% of doctors participating in specialization training indicated that cooperation between doctors and pharmacists should be included in medical education programs.

This lack of knowledge about the competences of Polish pharmacists means that currently 75.6% of doctors' contacts are limited only to corrections of the formal prescription (e.g., change of drug dosage) and 36.9% to modifications of ordered drugs (e.g. resulting from incorrect dosage, blocking of the active substance or unavailability of the drug on the market). Only about one-tenth of physicians in specialty training collaborate with pharmacists in reporting drug interactions and polypharmacy (10.2%) or reviewing medications (9%).

An important result of the presented study is that 31.8% of doctors, during specialization training, asked pharmacists for help in prescribing prescription drugs that are better suited to the individual needs of a specific patient, including adjusting the dose or concentration of the active substance to age.

However, this is a very narrow scope of cooperation, and the potential and knowledge of Polish pharmacists is not properly used. It is worth emphasizing that other countries had similar experiences when they introduced pharmaceutical care in the early 1990s, e.g., in Iceland [20]. Currently, however, the cooperation of Icelandic doctors and community pharmacists concerns only practical clinical issues, and the comments of Icelandic pharmacists are accepted by GPs in 90.3% of cases [20]. Similarly in the USA, where both professional groups positively assessed the pharmacist's assistance in detecting drug interactions [21].

As many as 38% of survey respondents believe that the current regulations of the health care system in Poland do not allow cooperation between pharmacists and doctors, and 20.6% have no opinion on this matter. There are different system solutions in many countries. For example, thanks to E-Systems, doctors and pharmacists play an important role in ensuring the safety and appropriate treatment of patients by avoiding

drug interactions [22]. Moreover, in Australia, pharmacists can offer many services that are attractive to patients, such as vaccinations, blood tests and medical certificates for excused absence from work [23]. Most of the above services are also possible under the Polish Act on the profession of pharmacist. Importantly, pharmaceutical care is currently a part of the national health service [24] and an element of comprehensive patient care.

Doctors expect support in patient care in various fields. According to the presented study, most doctors declared that the area of pharmacists' support should include patient education in the use of medical equipment (92.5%). A practical example here is adult-onset diabetes. A nationwide cross-sectional study shows that patients already diagnosed with diabetes still have significant gaps in knowledge about this disease. For this reason, primary care physicians, internists and diabetologists [25], and community pharmacists should be actively involved in the education of patients at increased risk of diabetes.

The results of American studies indicate that pharmacist intervention improves control of glucose level [26]. In this study, 89.2% of physicians noted that a community pharmacist can help them manage pharmacotherapy, which involves selecting the optimal treatment based on reliable and up-to-date scientific evidence (evidence-based health care (EBHC)) [27] and improving the patient's quality of life [28].

According to 87.8% of respondents, patients visiting primary care physicians will benefit most from cooperation between doctors and pharmacists. This is confirmed by the ambulatory care model in the USA, where cooperation with pharmacists has improved patient health outcomes, quality of care, and reduced health care costs [29]. Among other patient groups that can benefit from the cooperation of doctors and pharmacists, respondents mentioned: patients visiting specialist clinics – 43.6%; and patients undergoing hospital treatment – 37.9%.

Doctors training in this specialization indicated certain areas requiring changes that facilitate cooperation between doctors and pharmacists. The Act on the profession of pharmacist does not specify how and on what terms cooperation between a pharmacist and a doctor should exist, thus leaving room for inconsistency. Doctors prefer a formal framework for collaboration. As many as 91.6% of respondents indicated the need to develop guidelines and recommendations regarding cooperation between doctors and pharmacists.

For 70.1% of respondents, financing cooperation between doctors and pharmacists from public funds was of key importance. In many countries, such financing has accelerated the development of pharmaceutical care. A further barrier indicated by doctors training in this specialization was the lack of IT systems supporting cooperation and pharmaceutical care (69.5%).

Trust is an integral part of effective cross-industry collaboration. In the presented study, respondents were divided into three groups. The first and largest group of respondents expressed the opinion that doctors and pharmacists trust each other (definitely yes 2.2% and rather yes 35.8%). The second disagreed (not 3.5% and probably not 29.5%), and the third had no task on this topic (29.1%). The above division may result from the parallel discussion among young doctors regarding the no fault system and the Act on Quality and Patient Safety [30]. According to young doctors, it is important to build a culture of safety [31]. Building a culture of safety also means people providing health services getting to know each other, working together, and creating mutual trust [32].

This study provides specific guidance for future interprofessional collaboration. The results of this study will be beneficial for pharmacists and doctors, researchers, and decision-makers who want to introduce changes in the Polish health care system. The idea is to build a system that is safe for the patient and guarantees high-quality services based on cooperation between the doctor and the pharmacist.

The strength of our study is the large study sample on which we evaluated the cooperation of the pharmacist doctor. The Center for Postgraduate Medical Education is an entity that deals with postgraduate education of physicians from all over the country.

The current study has some limitations. Participants were recruited from physicians who participated in specialty training in mandatory courses in medical law and public health. Therefore, the analysis lacks clear differences in physicians' attitudes toward current collaboration with pharmacists and barriers according to gender, age, seniority, specialization obtained, and workplace size. Future studies should recruit participants from more diverse medical entities to address this concept.

Conclusions

The study shows that current cooperation between doctors and community pharmacists is limited to formal issues. Building cooperation between doctors and pharmacists must start at the education stage. Educational programs should be modified in such a way that doctors learn about the statutory capabilities and competences of pharmacists and prepare in a practical way for future cooperation by building mutual relationships based on trust. Doctors point to specific barriers that inhibit doctor-pharmacist cooperation. The most important of these are the development of recommendations. Recommendations should first cover the most critical areas of support for doctors, i.e., patient education and pharmacotherapy. The implementation of pharmaceutical care should start with the cooperation of primary care physicians and community pharmacists from available pharmacies.

Disclosures and acknowledgements

The authors declare no conflicts of interest with respect to the research, authorship, and/or publication of this article. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. Artificial intelligence (AI) was not used in the creation of the manuscript.

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