The pharmacists' patient care process in community pharmacy setting: evidence from Iran

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Abstract. *Background:* The Pharmacists' Patient Care Process (PPCP) as one of many inter-related foundations for the delivery of evidence-based and outcomes-focused patient care has a positive trend in academic literatures in the world. Unfortunately, PPCP has not been establish well in community pharmacies in Iran, yet. This study was performed to explore the current status of the provision and perception toward patient care services and finally evaluate professional competency of pharmacists about PPCP implementation, in both patients and pharmacist's perspectives. *Methods:* A cross-sectional study was conducted using two self-administrated Likert-based questionnaires_ one for pharmacists and another one for patients. In total, 121 pharmacists and 479 patients participated to the study. Questionnaires were distributed and collected in the Shiraz during the Oct 2017 till Jun 2018. Obtained data were analyzed through the statistical package for social sciences (SPSS) version 25. In addition, the competency to PPCP implementation was classified to three groups _good, moderate, and weak _ based on achieving ≥75%, 50%-75%, and <50% of the dimensions' total score, respectively. *Results:* The pharmacist's age range was 23-76 years (mean age: 40.61±12.85 years). Their Competency to PPCP implementation was good (43.8%), moderate (52%), and just 4% weak. Patient's response to PPCP was 11.2% good, 50.7% moderate and 35.6% weak. *Conclusion:* Besides promotion of public awareness about PPCP, improvement of pharmacists' motivation toward these services seems necessary. In addition, the introduced instrument may be useful for practice of pharmacists, but it should be used cautiously until it is tested among clients of pharmacies known to provide all levels of pharmacy care within pharmacy stores. (www.actabiomedica.com)

Keywords: Pharmacist's Patient Care Process, Community Pharmacy, Pharmacoepidemiology

Introduction

Healthcare system has expanded in different areas. Pharmacy as an inseparable part of this system supplies medicine, managed by pharmacists[1]. In addition, majority of clients are patients, similar to healthcare system[2]. Patient care is a professional practice of a pharmacist and one of the new areas of pharmacoepidemiology[3].

The international guideline of pharmacoepidemiology and Good Pharmacy Practice (GPP) was written as a framework[4-6]. This guideline explains and describes

this practice based on a universal consent, but Iran does not have any local GPP guideline. Pharmaceutical care as a professional practice in pharmacy is responding to patient's pharmacotherapy in hospital/community pharmacy or anywhere in the healthcare system[6,7]. Hence, each pharmacist should confirm aspects of the framework in the best way possible[7]. Thus, the proper context for pharmacists with a parallel structure to the other healthcare professional practice was named pharmacists patient care process (PPCP)[5,6]. The PPCP was approved and developed by the Joint Commission of Pharmacy Practice (JCPP) in 2014[5]. These processes were informed by a component of pharmaceutical care, comprising of five-step process in a wheel chart, where patient care is at the center (Figure 1). The five steps consist of Collect, Assess, Plan, Implement and Follow-up[5,8–15].

According to the Accreditation Council for Pharmacy Education (ACPE) standards in 2016, there is a need to teaching PPCP components to colleges and school of pharmacy students to improve pharmacotherapy outcomes and pharmacy services of patient care[9,16,17].

Since a lack of a standard process of care creates an environment that may result in unacceptable gaps in care. The PPCP provide a structure that all practitioners should follow and, when implemented correctly and consistently, can improve the quality of care. On the other hand, the PPCP cannot operate in a silo, the services must be clearly articulated and well understood by patients, their caregivers, payers, and other members of the care team. Without a consistent patient care process, it has been challenging for the profession of pharmacy to communicate the pharmacist's role to groups external to the profession and establish the distinct value pharmacists bring to an interprofessional care team. Moreover, the patient must know and understand what is to be delivered and to determine how best to receive the care provided. Likewise, other members of the health care team must determine how best to integrate the pharmacist's work into their efforts caring for the patient. As pharmacoepidemiology and social pharmacy are new disciplines in Iran, evidence on GPP and PPCP are limited. Therefore, this study was performed to explore the current status of the provision and perception toward patients care services (as a strategy to promote both healthcare quality and pharmacists' positions revival) and finally evaluate professional competency of pharmacists about PPCP implementation in both patients and pharmacist's perspectives.

Methods

2-1. Study population

The statistical population in this study was defined into two groups including pharmacists and patients. According to reports from Shiraz University of Medical Sciences, about 700 community pharmacies are active in Shiraz (Shiraz as a capital city of Fars
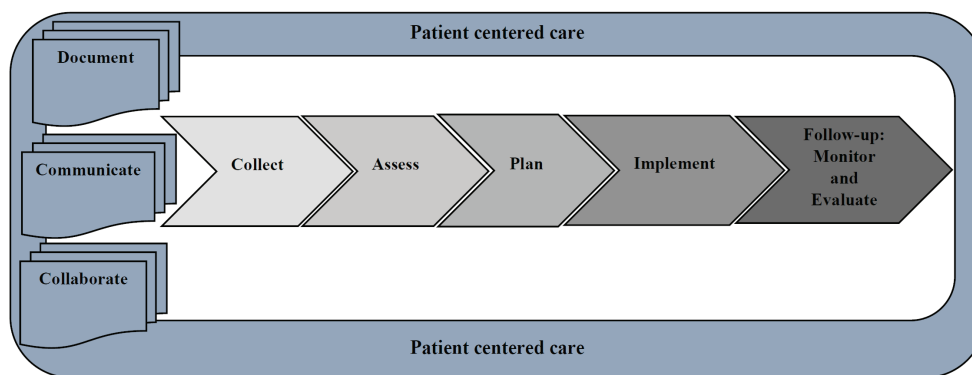

Figure1. The Pharmacist's Patient Care Process

province is located in the south-west of Iran). Sample size was calculated by disproportionate stratified random sampling, based on the density of pharmacies in each municipality regions of Shiraz. In this regard, totally 100 pharmacies were chosen randomly. Based on Statistician guide, if 3 to 5 randomly selected patients and 1 to 2 pharmacist in each pharmacy answered the questionnaires, it would be sufficient. The inclusion criteria for patients were people older than 18 years and those willing to answer the questions voluntarily. Finally, 121 pharmacists and 479 patients were participated. We don't use Informed consent.

2-2. Study design

This study was a cross-sectional study conducted in Oct 2017 to Jun 2018.

2-3. Instrument development

The questionnaires were developed based on literature review and communication with 10 experts in the field of pharmacy_ including pharmacists working as a pharmacy manager, pharmacy technical officer, staff of regulatory organizations, such as Iran Food and Drug administration, and academic experts. Finally, a self-administered questionnaire with five sections and 59 questions was developed and validated for pharmacist. Including demographic (age, gender, education level [illiterate to university degree], occupation), Medication-Therapy Management (MTM), Patient-Consulting Service (PCS), Disease Management (DM) and PPCP sections. For patients 33 questions organized into four sections. Including demographic (age, gender, education level, marital status, having insurance, having family physician, refer for OTC or prescription, being patient or accompanying a patient), pharmacy evaluation, Pharmacy consultant Services (PhCS) and PPCP. Table 1 shown details of each questionnaires.

The reliability of the questionnaire was tested through the Cronbach's α in a pilot study performed in a setting of 10 patients referred to 5 pharmacies (that selected randomly) for dispensing of their prescriptions. Cronbach's α for the pharmacies' and patients' questionnaire were 0.78 and 0.80, respectively[18,19].

2-4. Statistical analysis

Mean ± standard deviation (SD) and frequency (percent) were used to describe quantitative and qualitative variables, respectively. The comparison of quantitative variables between the groups was performed through the Mann-Whitney and Kruskal-Wallis tests for two and more than two groups, respectively. Chi-square test was used to compare the qualitative variables between the groups. In addition, the Spearman correlation coefficient was used to evaluate the statistical correlation between quantitative variables. All statistical analyses were performed through the statistical package for social sciences (SPSS) version 25. A P-value less than 0.05 was considered to be statistically significant.

In addition, competency of pharmacists about PPCP implementation from both pharmacists' and patients' perspective was classified to three groups _ good, moderate, and weak, based on achieving ≥75%, 50%-75%, and <50% of the dimensions' total score, respectively.

Results

The mean age of pharmacists was 40.61±12.85 years (ranged from 23 to 76 years). Their mean work experience was 17.22±11.58 years (ranging from 1 to 52 years). All participants were certified as a pharmacist (Pharm.D). More than half (54.6%) of them were male and 89 (74.8%) were married. Table 2 shows the characteristics of pharmacists in details.

The mean PPCP score was 19.82±3.39 (ranging from 10 to 27). 43.8% of the pharmacists considered themselves qualified to PPCP implementation (good). About 52% of them had moderate competency to PPCP implementation, and just 4% considered themselves as a weak competency. There was no significant correlation between PPCP competency score and age (r=-0.08, p=0.44) and work experience (r=-0.001, p=0.99). Gender (p=0.63) and marital status (p=0.83) had no significant effect on the PPCP competency score. Table 3 shows details of results of this part of study.

Table 1. The pharmacist and patient questionnaires

Pharmacist	Patients
Medication-Therapy Management (MTM): **8 questions** - Patients history - Patients pharmacotherapy follow up - Patients following up inclination - Proportion of patients in each work shift - Time to provide patients pharmacy services - Need guideline or reminder for providing the service - Need electronic information and helpfulness of electronic information	**Pharmacy evaluation:** **7 questions** - Accessibility of pharmacies - Availability of private area - Disable facilities (by detail) - Suitability of the environment for disabled patients - Pharmacist availability - Pharmacy staff dealing and behavior
Patient-consulting Service (PCS): **17 questions** - Time for consultation - Pharmacists inclination for consultation and pharmacy services - Patients consulting inclination - Patients self-remedy management education - Study time for patient's education - Pharmacotherapy guidelines acquaintance - Patients consulting based on pharmacotherapy guidelines - Refer patients to the pharmacy due to ADR - Used or completed yellow forms - Patients consulting for OTC demands - OTC demand patient's inclination for consulting - Patients education for medical equipment - Pharmacists knowledge for education for medical equipment - Suitable consultation area in pharmacy - Helpfulness of prescription and OTC consultation - Time of consultation - Consultation costs	**Pharmacy Consultant Services (PhCS):** **8 questions** - Pharmacist availability for OTC consultant - Know the pharmacist - Responsiveness of the pharmacist - Suitable consultation area in pharmacy - Need to consider a suitable consultation area in pharmacy - Prescribed consultant by the pharmacist - Details of medication consumption - Giving the right to choice different brands and prices
Disease Management (DM): **2 questions** - Patients diseases and surgical history - Pharmacist collaboration with other health care members for evaluation and monitoring the outcome of pharmacotherapy process	
Pharmacist Patients Care Process (PPCP): **15 questions** - Patients pharmacotherapy history - Patients ADR history - Pharmacists referring to guidelines for consulting or manage ADR - Patients socioeconomic history - Dose adjusting for patients with chronic or rare disease or particular group ages - Dose adjusting based on patients' clinical information - Pharmacist knowledge for dose adjustment - Pharmacist knowledge about PPCP. Way? - Pharmacists' inclination for introduction to PPCP - Probability of PPCP implementation - Pharmacists' readiness for implementation of PPCP	**Pharmacist Patient Care Process (PPCP):** **7 questions** - Ask disease history - Ask mediation history - Food and drug interaction explains - Efficacy or patient satisfaction with previous medications - Drug storage explains - How to use medical equipment and drug - Necessity of educational leaflet

Table 2. Characteristics of pharmacists and patients participated in the study

		Pharmacists (n=121)	Patients (n=479)
Age	≤ 30	33 (30.3)	172 (39)
	31 – 40	27 (24.8)	134 (30.3)
	41 - 50	25 (22.9)	69 (15.7)
	≥ 51	24 (22)	66 (15)
Gender	Male	65 (54.6)	255 (53.23)
	Female	54 (45.4)	224 (46.46)
Marital status	Married	89 (74.8)	304 (64.5)
	Single	30 (25.2)	167 (35.5)
Education level	≤ Diploma	-	206 (43.9)
	> Diploma	-	263 (56.1)
Family physician	Yes	-	329 (70.4)
	No	-	138 (29.6)
Pharmacy visit for	Prescription	-	355 (83.7)
	OTC	-	58 (13.7)
	Emergency	-	11 (2.6)
Pharmacist status	Responsible Pharmacist	51 (42.1)	-
	Responsible Pharmacist and owner of pharmacy store	70 (57.9)	-
Work experience, year		17.22±11.58	-
Quantitative variables are described by mean±SD; Qualitative variables are described by frequency (percent)			

More than 90% of pharmacist had fix patients. About 68% of continues referral patients tended to follow the pharmacotherapy process by the pharmacists. Seven binary questions (answered as Yes-No) were asked from the pharmacists about MTM, scored from 0 to 7. Higher score indicates good practice. The mean MTM score was 5.46±1.29 (ranged from 2 to 9). MTM was good, moderate, and weak amongst 56.2%, 33.9%, and 9.9% of the pharmacists, respectively. It significantly correlated with age (r=0.2, p=0.04) and work experience (r=0.24, =0.03). There was no significant correlation between MTM and patient-consulting services (PCS) (r=0.09, p=0.35), medical care (r=0.08, p=0.36), and disease management (r=0.07, p=0.47). Gender (p=0.14) and marital status (p=0.41) had no significant association with the MTM score (Table 3). Total of 88.4% of the patients tended to receive consultation\advise on their medications, and 71.9% of the pharmacists stated that in the face of any possible adverse drug reaction (ADR), patients turn back to the pharmacies. 66.9% of the pharmacists expressed that OTC consultation is given to patients. Just 11.6% of the pharmacists did not have any specific time to upgrade their scientific level and consultation abilities. However, 87.6% of the pharmacists devote a mean 1.89±1.74 days-per-month for upgrading their scientific knowledge and skills. 59.5% of the pharmacists expressed that payment for consultation\advise is necessary while 79.3% expressed that consultation room is necessary.

Nine binary questions were asked from the pharmacists regarding patient-consulting services (PCS), scoring from 0 to 9; higher score indicates good practice. The mean score was 6.84±1.32 (ranged 3 to 9). Patient-consulting was good 62.8%, moderate 31.4%, and weak 5.8% of the pharmacists. It significantly correlated with age (r=-0.33, p=0.001), work experience (r=-0.24, p=0.03), medical care (r=0.24, p=0.01), and

Table 3. Pharmacists' provision and perception toward patient care services

		MTM	P	PCS	P	PPCP	P	DM	P	Total	P
Total		5.44±1.29		6.83±1.31		6.52±2.05		0.96±0.74		19.77±3.35	
Age	≤ 30	5.06±1.45	**0.02**	7.30±0.84	**0.01**	7.03±1.55	0.35	0.87±0.78	0.67	20.27±2.79	0.59
	31 – 40	5.29±1.32		6.85±1.45		6.14±2.24		1.07±0.54		19.37±3.67	
	41 – 50	6.00±1.29		7.16±1.14		6.00±2.44		0.96±0.73		20.12±3.41	
	≥ 51	5.66±0.86		5.91±1.24		6.37±2.10		1.08±0.88		19.04±3.55	
Gender	Male	5.58±1.34	0.13	6.60±1.34	0.05	6.43±2.09	0.73	0.96±0.72	0.93	19.58±3.42	0.62
	Female	5.31±1.25		7.09±1.26		6.59±2.02		0.98±0.78		19.98±3.35	
Marital status	Married	5.52±1.22	0.41	6.83±1.39	0.72	6.44±2.13	0.58	0.94±0.75	0.56	19.75±3.49	0.83
	Single	5.20±1.49		6.83±1.05		6.76±1.81		1.03±0.71		19.83±2.94	
Pharmacist status	Responsible Pharmacist	5.21±1.34	0.05	7.23±1.10	**0.01**	6.78±1.73	0.47	0.86±0.74	0.13	20.09±3.04	0.68
	Responsible Pharmacist and owner of pharmacy store	5.64±1.23		6.55±1.40		6.35±2.25		1.07±0.74		19.62±3.63	

MTM: Medication–Therapy Management   PCS: Patient-Consulting Service   PPCP: Pharmacist Patients Care Process   DM: Disease Management

Table 4. patients' provision and perception toward patient care services

		Pharmacy evaluation	P	PhCS	P	PPCP	P
Total		13.76±3.50		17.36±5.04		40.32±11.46	
Age	≤ 30	13.51±3.35	0.21	17.25±4.96	0.81	40.36±11.27	0.85
	31 – 40	13.54±3.41		17.12±4.98		39.48±11.23	
	41 - 50	14.28±3.71		18.04±5.25		41.37±11.97	
	≥ 51	14.31±3.79		17.42±5.22		40.81±11.98	
Gender	Male	13.86±3.52	0.57	17.58±5.14	0.33	40.98±11.61	0.13
	Female	13.72±3.46		17.16±5.06		39.77±11.55	
Marital status	Married	13.97±3.60	0.09	17.52±5.06	0.35	40.84±11.69	0.26
	Single	13.49±3.21		17.04±5.19		39.68±11.23	
Education	≤ Diploma	14.53±3.52	**0.01**	17.45±5.11	0.84	41.27±11.73	0.31
	> Diploma	13.22±3.36		17.44±5.11		39.85±11.48	
Family physician	Yes	13.75±3.47	0.87	17.04±5.27	**0.04**	39.54±11.50	**0.03**
	No	13.89±3.52		18.18±4.51		42.38±11.33	
Pharmacy visit for	Prescription	13.88±3.41	0.51	17.33±5.04	0.18	40.61±11.29	0.61
	OTC	13.36±3.76		18.03±5.55		40.17±12.41	
	Emergency	13.18±4.51		15.10±5.66		36.09±14.37	
PhCS= Pharmacy Consultant Services PPCP= Pharmacist Patients Care Process							

disease management (r=0.18, p=0.048). There was no significant correlation between patient-consulting and MTM (r=0.09, p=0.35). Gender (p=0.05) and marital status (p=0.72) had no significant association with the patient-consulting score (Table 3).

Nine binary questions were asked from the pharmacists about pharmaceutical care, scored from 0 to 9; higher score indicates good practice. The mean score was 6.53±2.05 (ranging from 1 to 9). Pharmaceutical care was good, moderate, and weak amongst 53.7%, 30.6%, and 15.7% of the pharmacists, respectively. It significantly correlated with patient-consulting (r=0.24, p=0.01) and disease-management (r=0.25, p=0.01). Pharmaceutical care had no significant correlation with age (r=-0.08, p=0.38), work experience (r=-0.03, p=0.77), and MTM (r=0.08, p=0.36). Gender (p=0.73) and marital status (p=0.58) had no significant association with the pharmaceutical care score (Table 3). Two binary questions were asked from the pharmacists about disease-management, scored 0 to 2; higher score indicates good practice. The mean score was 0.98±0.75 (ranging from 0 to 2). Disease management was good amongst 27.3%,

moderate 43.8%, and weak 28.9% of the pharmacists. It significantly correlated with patient-consulting (r=0.18, p=0.48) and medicinal-care (r=0.25, p=0.007). Disease management had no significant correlation with age (r=0.85, p=0.37), work experience (r=0.09, p=0.41), and MTM (r=0.07, p=0.47). Gender (p=0.73), and marital status (p=0.56) had no significant association with the disease-management score (Table 3).

Patients mean age was 35.96±11.90 years (ranging from 18 to 70 years). More than half (53.23%) were male, and 64.5% were married. 56.1% had an academic education. Table 2 shows the characteristics of patients in detail. The patients evaluated PPCP as good (11.2%), moderate (50.7%), and weak (35.6%). They scored pharmacies as good (33.8%), moderate (48.2%), and weak (18%). Also, pharmacy consultant services were evaluated as good (14.7%), moderate (51.2%), and weak (34.1). Table 4 shows the details of patients' attitude about receiving patient-care in pharmacies. The patients' attitude about pharmaceutical care significantly correlated with PPCP score (r=0.12, p=0.009) and the PPCP score (r=0.11).

Discussion

Pharmacists are specially educated to focus on medication-related problems to improve and ensure achievement of optimal patient care. However, pharmacists would collaborate with other healthcare professionals to design, implement, and monitor a therapeutic plan to achieve desired therapeutic outcomes in their patients as described in the PPCP. The current study, in both patients and pharmacist's perspectives, shown the status of the provision and perception toward patient care services and professional competency of pharmacists about PPCP implementation.

In European countries, many studies were performed in different fields related to patient and pharmaceutical care[8]. However, very few studies on indicators of pharmacy patient care are from the Middle East region including Iran. Therefore, given the importance of this issue, this study was performed to investigate PPCP indicators status from the two aspects including patients' attitude about receiving patient-care in pharmacies, and pharmacists' attitude on this regard. Approximately, 90% of patients assessed patient-care as moderate to weak. Also, more than 80% of patients gave moderate to weak scores to consultant services. In contrast to previous studies, overall patient satisfaction with pharmacy services was low in our region although there were some differences by locations [20–25].

Patient care status of pharmacists presented by our study is shown as 62% (moderate to high), though, the result was lower than a previous study performed in a community setting, (91% moderate to high) [26]. Also, Nigerian study showed that 56.5% of the respondents rated the PPCP as good [27], but this rate was 11.2% in our study. In this study, the level of satisfaction on the pharmacy services provided by patients was more on moderate to weak, which was similar to the findings by Eades et al, where they showed that the customers perceived community pharmacists as drug experts [28].

Patients who had family physician significantly had a lower score for pharmacy consultant services and PPCP in comparison to those who did not have family physician. Regarding pharmacy score, patients with a lower education degree (diploma and lower) were significantly more satisfied and gave higher score to pharmacies compared to more educated peoples. Younger pharmacists (30 years old and younger) (7.30) showed significantly higher score for Patient-Consulting satisfaction in comparison to the older pharmacists (6.8, 7.1 and 5.9).

Regarding PPCP score, the situation was better in our study (43.8% and 52% was good and moderate, respectively) than what reported in Qatar, where only 37% of the pharmacists had moderate PPCP knowledgeable and ready to answer questions[29]. It was reported that accessibility, consultation room, disabled facilities, environment and decoration, pharmacist availability, pharmacy staff attitude resulted in limited patient interaction impeding the formation of interpersonal trust [30]. The OTC consultant, prescribed consultant, details of medication consumption were of concern for more than 50 % of participants in our study, which was in line with other studies [11].

In our study, the patients' attitude about PPCP significantly correlated with the PPCP score and PPCP score. Patients were more satisfied with pharmacists who gave more care service and had more score of pharmacy patient care. It seems that many pharmacists' associations have committed to implement pharmacy patient care and schools of pharmacy also have recognized the importance of this field, and it might be expected that there will be more pharmacy care in pharmacies in the near future. Also, to improve and modify the attitude, knowledge, and skills of pharmacists, there must be some forms of remuneration for their provision of patient care.

In the meantime, the pharmacist should make sure that patient care does not grow out of proportion, meaning "being nice to the patient." Key managing personal in the health system chain should detect, prevent, or correct drug-related problems[22–25]. Pharmacy services in western countries look like to have the best status. Pharmacy care should, therefore, become part of the pharmacy carrier and GPP.

While the questionnaire was developed primarily to be used in Iran, it could also be used elsewhere. At the front line, community pharmacists in Iran and surrounding regions could benefit from these findings by identifying areas for improvement in their patient care service, which could eventually lead to enhanced and improved patient satisfaction by optimizing

pharmacotherapy. To the best of our knowledge, this is the first study to investigate the role of pharmacist towards PPCP in an Iran community setting. This study had several limitations, such as the fact that the questionnaire does not allow the investigator to determine the respondents' sincerity, apparent reluctance, or even their evasiveness as obtainable through interview. Open-ended questions allow for better expression of respondents' view. However, it could increase the risk of misinterpretation. Closed or leading questions, on the other hand, minimizes the risk of misinterpretation by the investigator, but the categories should be comprehensive and mutually exclusive. A combination of the two has been used to minimize the limitations associated with the validity, reliability, and usability of the questionnaire. All these domains might not have been completely captured. Hence, the results of this study cannot be generalized to all pharmacists. The views might be different amongst the pharmacist in different regions of the world. A larger study is recommended to extrapolate and generalize the results. To conclude, this study is the first to use a pharmaceutical patient care instrument developed explicitly for the Iranian community pharmacists. Patient view scores in all dimensions were significantly lower than the pharmacist scores, suggesting patients have unmet expectations from community pharmacy services in Iran. The findings of this study revealed the disagreement between the view of pharmacist regarding care and patients claims. The pharmacist declared acceptable level regarding patient care, while patients were not satisfied. Our data can be useful for practicing pharmacists, but it should be used cautiously until it is tested among pharmacies known to provide different levels of care.

It should be noted that this study was done as a preliminary work for the recognition of patient care indicators status in Shiraz community pharmacist. Defining the role of pharmacist regarding patient care, introducing a validated checklist for pharmacy patient care evaluation, within the current community pharmacy patient care models is essential in delineating a viable and sustainable practice model for pharmacists. It is necessary for pharmacists to be able to reach out to patients, evaluate their hesitations and promptly offer the best choice, as the survey indicates. They should play a bold role in becoming an indispensable staff of healthcare group. Finally, policymakers must establish validated tools to assess patient care of community pharmacists, and on the other hand, help pharmacists to equip themselves with updated knowledge and skills regarding patient care indicators.

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Author Contributions

All the authors have significantly contributed to the work and the involvement of each author was as follows:

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Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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