International Journal of Clinical Pharmacy (2019) 41:478–487
https://doi.org/10.1007/s11096-019-00802-w

RESEARCH ARTICLE

Community pharmacists' opinions and practice of pharmaceutical care at chain pharmacy and independent pharmacy in China

Xiaoyu Xi[1] · Yuankai Huang[1] · Qianni Lu[1] · Carolina Oi Lam Ung[2] · Hao Hu[2]

Received: 4 June 2018 / Accepted: 19 February 2019 / Published online: 12 March 2019

Abstract

Background Whether Chinese community pharmacists in chain pharmacies and independent pharmacies provide the same type and quality of pharmaceutical care has not been fully investigated. *Objective* This study aimed to investigate community pharmacists' understanding, attitude, practice and perceived barriers of pharmaceutical care at chain pharmacies and independent pharmacies in China. *Setting* Community pharmacies in China. *Method* A questionnaire survey was conducted in 27 provinces (autonomous regions) and 4 municipality cities in China. *Main outcome measure* Chinese community pharmacists' understanding, attitude, practice and perceived barriers of pharmaceutical care. *Results* The respondent pharmacists' understanding of pharmaceutical care was only moderate, though they showed a positive attitude towards providing the service. The respondent pharmacists from both chain and independent pharmacies provided more basic pharmaceutical service than advanced pharmaceutical care. Regarding barriers to providing pharmaceutical care, the respondent pharmacists identified the main barriers as a lack of physical space, slow introduction of pharmacist law, lack of patient acceptance of pharmaceutical care, and lack of face-to-face communication with patients. Pharmacists at chain pharmacies had a better understanding of and attitude toward pharmaceutical care and practiced more advanced pharmaceutical care than pharmacists at independent pharmacies. *Conclusion* Chinese community pharmacists' understanding and practice of pharmaceutical care in China needs improvement. Compared with pharmacists at chain pharmacies, pharmacists at independent pharmacies face more challenges in providing pharmaceutical care. Specific efforts should be made to improve pharmacist competence, increase patient acceptance and shape a better operative environment for community pharmacies, especially for independent pharmacies.

Keywords Chain pharmacy · China · Community pharmacist · Community pharmacy · Independent pharmacy · Pharmaceutical care

Impacts on Practice

- Pharmacists at chain pharmacies and independent pharmacies in China should be given equal opportunities and conditions to develop their professionalism in pharmaceutical care
- Further changes to the Chinese pharmacy education system and pharmacist training system are necessary to improve pharmacists' professionalism in pharmaceutical care provision.
- Issues such as the responsibilities of the pharmacists, the value of pharmaceutical care and the role of the patients should be emphasized in the provision of pharmaceutical care in China.
- New models of remuneration need to be developed that will support the provision of pharmaceutical care.

Xiaoyu Xi and Yuankai Huang are co-first authors.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s11096-019-00802-w) contains supplementary material, which is available to authorized users.

✉ Hao Hu
haohu@um.edu.mo

[1] National Development Research Center of Licensed Pharmacist, China Pharmaceutical University, Nanjing, Jiangsu, China

[2] State Key Laboratory of Quality Research in Chinese Medicine, Institute of Chinese Medical Sciences, University of Macau, N22-2057, Taipa, Macao, China

Introduction

Pharmaceutical care, defined as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life", has been widely promoted for more than three decades [1]. In countries with sophisticated health systems, such as the United States of America and some European countries, community pharmacists in both chain pharmacies and independent pharmacies widely practice pharmaceutical care that includes basic clinical diagnosis, medication compliance, medication efficacy monitoring, and medication information record feedback [2]. Particularly for patients with chronic diseases, community pharmacists are charged with the responsibility of continuously supporting the proper use of medication with the provision of pharmaceutical care outside the hospital setting [3].

Comparatively, China's community pharmacy system is still at an early stage of development [4, 5], and the quality of pharmaceutical care provided at community pharmacies varies. In the past, due to a lack of pharmacy education in universities, a person with only college education was allowed to take the job of pharmacist. Now, even with the pharmacist licensing system, the pre-requisites regarding the educational background of candidates eligible to take the qualification examination to become a licensed pharmacist still have great variations. According to the *Interim Provisions on the Qualification System for Licensed Pharmacists*, applicants with an academic degree of medicine (including clinical pharmacy), Chinese traditional medicine or other medicine-related majors at the college level or higher are all allowed to take the examination and, upon satisfying the basic requirements, become a licensed pharmacist. Moreover, the legal requirements for the provision of pharmaceutical care at community pharmacies are not clearly defined. As stipulated in *Detailed Regulations for the Administration of Quality Management of Pharmaceuticals (National pharmaceutical and market administration [2000] No. 526)*, the licensed pharmacist(s) or pharmacist(s) is required to be on duty during business hours and to check and sign the prescription whenever a prescription-only pharmaceutical product is dispensed. Nevertheless, the need for and the measures of improvement in the pharmaceutical care provided in community pharmacies in China have been repeatedly discussed [6, 7]. The co-existence of chain pharmacies and independent pharmacies has raised much debate about pharmaceutical care differences between these two types of community pharmacies [8].

In China, 'chain pharmacy' refers to a number of pharmacies that operate under similar practice models of pharmaceutical services and use a unified business name. Under the management of the same headquarters, a unified chain procurement or franchise is adopted to achieve economies of scale in business organization. Usually, a company of chain pharmacies is formed with at least 10 community pharmacies that implement standardized management [9]. 'Independent pharmacy' refers to a community pharmacy that independently operates and manages its assets, personnel and drug purchases and has not joined any chain pharmacy system [10].

By the end of November 2016, in China there were 5609 chain pharmacy companies nationwide owning 220,703 chain pharmacies, and 226,331 independent pharmacies [11]. The differences, if any, in the quality of pharmaceutical care provided in chain pharmacies compared to independent pharmacies have drawn research interest. A study in Chengdu, China, found that at least from the consumers' point of view, the quality of pharmaceutical care at these 2 types of pharmacy varied, and the need for different strategies of improvement was discussed [12].

Many factors contribute to the differences in pharmaceutical care provided in different business settings, including cognitive level and subjective attitude of community pharmacists towards pharmaceutical care, practical obstacles that community pharmacists encountered at their workplace, and their overall workload. Pharmacists' understanding of pharmaceutical care and subjective attitude could influence the subjective goals, trends and behaviours of pharmacists in the process of providing pharmaceutical care, thus affecting the output of their service on patients [6, 13–15]. Another important factor influencing pharmacists' ability to provide quality pharmaceutical care is the work environment and their accessibility to resources and support at the pharmacy [16–19]. Practical obstacles inhibiting pharmaceutical care provision would also affect the efficiency and output of services. The workload of pharmacists was identified as another important determinant of the service effectiveness, which would eventually affect the actual quality of pharmaceutical care to some extent [20–22]. Community pharmacists in chain pharmacies and independent pharmacies may experience different working conditions, especially in China, but whether they would provide the same type and quality of pharmaceutical care has not been fully investigated in either the international or the Chinese literature. The possible differences could provide valuable insights informing the development of Chinese community pharmacy system and improvement of pharmaceutical care provision at chain and independent pharmacies globally.

Aim of the study

This study aimed to investigate Chinese community pharmacists' understanding, attitude, perceived obstacles and workload of pharmaceutical care at both chain pharmacies

and independent pharmacies. It was expected that the findings would help to inform strategies to promote the development of chain pharmacies and independent pharmacies in a complementary way to improve the overall pharmaceutical care at the community level in China.

Ethics approval

The research design was reviewed and approved the Ethics Committee of China Pharmaceutical University at Nanjing City, Jiangsu Province of China (Project Number: CPU2017016).

Methods

Sampling

To realize the research objective above, a questionnaire survey method was applied for this study. To collect information from different regions in China, this study applied a stratified sampling strategy to sample chain pharmacies and independent pharmacies throughout China. Samples covered 27 provinces (autonomous regions) and 4 municipality cities. First, we divided all municipal administrative units of 27 provinces and 4 municipalities into three groups based on disposable income per person. Second, we divided the cities in each group into three subgroups according to the number of permanent residents. Third, we randomly selected 3 cities in each subgroup as the research target cities (see "Supplementary material 1 for summary of sampling cities"). Fourth, on the principle of respondent accessibility, we selected 2 chain pharmacies and 2 independent pharmacies in each target city to survey community pharmacists.

Data collection

This study was an interviewer-assisted survey. Fifty-four data collection assistants were recruited for survey implementation. All data collection assistants were undergraduate students majoring in pharmacy. Before the beginning of the survey, the research team conducted training to ensure that all the data collection assistants were aware of the research purpose, content, survey process, and ethical requirements. During the survey process, the data collection assistants were paired up to help facilitate the completion of each survey.

The actual survey was conducted in July and August 2017. The data collection assistants collected data in the form of face-to-face interviews, using survey software to obtain and store responses to the questionnaires to ensure data quality. Each survey was conducted at the pharmacy with available participants, who gave informed consent in writing prior to the start of the survey.

Questionnaire design

The survey questionnaire was designed by first consulting the literature, mostly written in English [13, 14, 19, 23–28]. To adapt the questions to the local context and to ensure the accuracy of the translation, two groups of translators were recruited. Each translator group consisted of one native Chinese speaker who was proficient in English and one native English speaker who was proficient in Chinese. First, each group independently translated the questions and the response options. Second, after completing the translation, the researchers and the four translators proofread and discussed the content of the questionnaire to agree on the first draft of the questionnaire. Third, we invited a number of experts with pharmacy management experience to review the questionnaire. Fourth, we conducted pilot test at three chain pharmacies and three independent pharmacies in Nanjing city, Jiangsu province. The research team modified the questionnaire according to this feedback to develop the final questionnaire (see "Supplementary material 2").

The first section of the questionnaire collected the social-demographic information of the respondents, including the respondent pharmacist's gender, age, educational background, education degree, work duration, and position (manager or staff) at pharmacy.

The second section of the questionnaire examined the pharmacist's understanding of pharmaceutical care. This part was developed on the basis of the definition of pharmaceutical care and the guidelines for pharmaceutical care published by the American Society of Health-system Pharmacists [1, 28]. It consisted of 12 true-or-false questions, 5 of which were reverse items, whereby the correct responses were 'false'. These questions covered the definition and content of pharmaceutical care, responsibilities and roles of pharmacist, patient's responsibility, obligation in pharmaceutical care, and conditions for pharmaceutical care.

The third section examined pharmacist's attitude towards pharmaceutical care. This part was mainly based on the Pharmaceutical Care Attitude Survey (PCAS) and its modified versions for community pharmacists [13, 19, 23]. It consisted of 14 items, each of which was measured with a 5-level Likert scale ranging from 1 (completely agree) to 5 (completely disagree). The items mainly covered the pharmacist's degree of recognition of the content, model and output of pharmaceutical care.

The fourth section of the questionnaire examined the practice frequency of each service item of pharmaceutical care by community pharmacists. It consisted of 9 items on a 5-level Likert scale based on requirements or guidelines of

pharmaceutical care provision [24–26, 28] ranging from 1 (very frequent) to 5 (almost never).

The fifth section of the questionnaire was about the barriers perceived by the respondent pharmacists to providing pharmaceutical care. This part had 11 items and used a 5-level Likert scale based on the literature [13, 16–19, 27], ranging from 1 (completely agree) to 5 (completely disagree).

Data analysis

For data analysis, descriptive analysis was first conducted to present participant characteristics and their responses to questionnaire items: frequency (%) for category data; mean (SD) for continuous data. In addition, Crosslab analysis using the Chi squared test was applied to compare the differences between chain pharmacies and independent pharmacies. All the data were analysed with SPSS 24.0 for Windows. Statistical significance was set as $p < .05$.

Results

Demographics

A total of 163 participant pharmacists were included as valid samples, including 89 (54.6%) from chain pharmacies and 74 (45.4%) from independent pharmacies (Table 1). More than 60% were female, and 83.2% of participants from chain pharmacies and 79.7% of participants from independent pharmacies had studied pharmacy (including traditional Chinese medicine (TCM) pharmacy). The mean (± SD) age was 31.9 (± 6.5) years for participants from chain pharmacies and 28.5 (± 4.8) years for participants from independent pharmacies. The mean (± SD) work duration of participants at the chain pharmacies was 8.4 (± 7.2) years, which was longer than the 5.2 (± 4.1) years of participants from independent pharmacies.

Participants from chain pharmacies had a higher level of education on average. For example, 59.6% participants from chain pharmacy had a bachelor degree, whereas only 44.6% participants from independent pharmacies did. While only 13.5% participants from chain pharmacies held manager positions, 31.1% participants from independent pharmacies were managers.

Table 1 Characteristics of participant pharmacists

	Chain pharmacies, n (%)	Independent pharmacies, n (%)
Participants	89 (54.6%)	74 (45.4%)
Sex		
Male	34 (38.2%)	26 (35.1%)
Female	55 (61.8%)	48 (64.9%)
Age, y, mean (± SD)	31.9 (± 6.5)	28.5 (± 4.8)
Work duration, y, mean (± SD)	8.4 (± 7.2)	5.2 (± 4.1)
Education level		
Specialized secondary school	18 (20.2%)	19 (25.7%)
College	17 (19.1%)	22 (29.7%)
Bachelor	53 (59.6%)	33 (44.6%)
Master	1 (1.1%)	0 (0.00%)
Major		
Clinical pharmacy	3 (3.4%)	1 (1.4%)
Pharmacy (TCM)	74 (83.2%)	59 (79.7%)
Medicine	5 (5.6%)	2 (2.7%)
Other medicine related majors	7 (7.9%)	12 (16.2%)
Position		
Manager	12 (13.5%)	23 (31.1%)
Staff	77 (86.5%)	51 (68.9%)

Understanding of pharmaceutical care

For the items testing community pharmacists' understanding of pharmaceutical care, the results showed that the level of understanding was only moderate, warranting further improvements (Table 2). Only for 3 items, Item [6] "In pharmaceutical care the pharmacist identifies and manages a patient's existing and other potential drug therapy problems", Item [11] "Provision of pharmaceutical care offers a feedback of drug therapy that optimizes the use of pharmaceuticals" and Item [12] "The patients don't have to actively cooperate in the provision of pharmaceutical care", did more than 50% respondents from both chain and independent pharmacies choose the correct responses. On the other 9 items, fewer than half of respondents chose the right responses.

Comparatively, the understanding of the term 'pharmaceutical care' was higher among pharmacists from chain pharmacies than by those from independent pharmacies. In particular, the differences were statistically significant for four items: Item [3] "The content of pharmaceutical care is consultation service of drug use" (27.6% vs. 14.1%; $p = .028$)"; Item [9] "Pharmaceutical care requires support from drug information resources" (73.6% vs. 35.0%; $p = .004$); Item [10] "A consultation room or private area is required by pharmaceutical care providers to provide services" (62.6% vs. 47.9%; $p = .043$); and Item [12] "The patients don't have to actively cooperate in the provision of pharmaceutical care" (96.9% vs. 62.6%; $p = .013$).

Attitude towards pharmaceutical care

Generally, the participants showed a positive attitude towards the responsibility and value of providing

Table 2 Understanding of pharmaceutical care by participant pharmacists

Item	Chain pharmacies, n (%)	Independent pharmacies, n (%)	*p*
[1] Pharmaceutical care providers are directly responsible for patient's medical outcomes	24 (27.0%)	23 (31.3%)	.422
[2] The primary aim of pharmaceutical care is to maintain and improve the patient's quality of life	39 (43.6%)	28 (38.0%)	.289
[3] The content of pharmaceutical care is consultation service of drug use [R]	**25 (27.6%)**	**10 (14.1%)**	**.028**
[4] The term "clinical pharmacy" is interchangeable with "pharmaceutical care" [R]	20 (22.2%)	15 (20.9%)	.795
[5] Pharmaceutical care is an extension of the current community pharmacy services [R]	17 (19.0%)	10 (13.5%)	.256
[6] In pharmaceutical care the pharmacist identifies and manages a patient's existing and other potential drug therapy problems	68 (76.7%)	59 (80.4%)	.564
[7] Pharmaceutical care involves a defined process of activities, all steps of which must be completed to provide this service	19 (21.5%)	11 (14.7%)	.153
[8] All patients taking prescription drug(s) need pharmaceutical care	14 (16.0%)	10 (14.1%)	.735
[9] Pharmaceutical care requires support from drug information resources	**66 (73.6%)**	**26 (35.0%)**	**.004**
[10] A consultation room or private area is required by pharmaceutical care providers to provide services	**56 (62.6%)**	**35 (47.9%)**	**.043**
[11] Provision of pharmaceutical care offers a feedback of drug therapy that optimizes the use of pharmaceuticals	76 (85.3%)	58 (78.5%)	.134
[12] The patients don't have to actively cooperate in the provision of pharmaceutical care [R]	**86 (96.9%)**	**46 (62.6%)**	**.013**

R = Reverse item

Bold values indicate $P < 0.05$

pharmaceutical care to patients and towards the health system (see "Table 3"). Some 65.2% pharmacists from chain pharmacies and 63.5% pharmacist from independent pharmacies strongly agreed with Item [2] "Primary responsibility of pharmacists in healthcare settings should be to prevent and solve medication-related problems"; and 62.9% and 56.8% strongly agreed with Item [12] "I feel that practicing pharmaceutical care will benefit health care in general". However, to some extent, they were reluctant to actively participate in pharmaceutical care activities. For example, only 21.4% pharmacists from chain pharmacies and 6.8% pharmacists from independent pharmacies strongly agreed with Item [1] "All pharmacists should perform pharmaceutical care", implying there were barriers for pharmacists to providing pharmaceutical care.

In addition, the attitude of pharmacists from chain pharmacies and independent pharmacies was significantly different in the following four items: Item [4] "Pharmacy students can perform pharmaceutical care during their clerkship" ($p = .034$); Item [7] "I hope my pharmacy can provide pharmaceutical care" ($p = .003$); Item [11] "I feel that pharmaceutical care will improve patient health" ($p = .017$); and Item [13] "Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist [R]" ($p = .043$). Comparatively, the pharmacists from chain pharmacies showed a more positive attitude in these four items.

Practice of pharmaceutical care

As shown in "Table 4", pharmacists from both chain and independent pharmacies practiced more basic pharmaceutical care, such as Item [1] "Communicate with patients or customers in the counselling area", Item [3] "Provide patients with direction for drug administration, dosage, and precautions", Item [4] "Monitor adverse drug reactions and drug compliance among patients", Item [7] "Conduct health education for patients", and Item [9] "Promote drug safety knowledge outside community settings". However, they provided less service on Item [2] "Perform prescription check", Item [5] "Engage in health screening activities", Item [6] "Create a personal medication record", and Item [8] "Provide general health information and medication information to patients", showing slow progress in practicing advanced aspects of pharmaceutical care.

In addition, the practice frequency of pharmacists from chain pharmacies and independent pharmacies was significantly different in the following four items: Item [2] "Perform prescription check" ($p = .002$); Item [4] "Monitor adverse drug reactions and drug compliance among patients" ($p = .004$); Item [7] "Conduct health education for patients" ($p = .000$); and Item [9] "Promote drug safety knowledge outside community settings" ($p = .000$). The pharmacists from chain pharmacies had practiced more in these four aspects.

Table 3 Attitude towards pharmaceutical care by participant pharmacists, n (%)

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		*p*
	Chain	Independent	Chain	Independent	Chain	Independent	Chain	Independent	Chain	Independent	
[1] All pharmacists should perform pharmaceutical care	19 (21.3%)	5 (6.8%)	14 (15.7%)	22 (29.7%)	30 (33.7%)	27 (36.5%)	14 (15.7%)	11 (14.9%)	12 (13.5%)	9 (12.2%)	.794
[2] Primary responsibility of pharmacists in healthcare settings should be to prevent and solve medication-related problems	58 (65.2%)	47 (63.5%)	6 (6.7%)	11 (14.9%)	9 (10.1%)	6 (8.1%)	6 (6.7%)	3 (4.1%)	10 (11.2%)	7 (9.5%)	.983
[3] Pharmacists' primary responsibility should be to practice pharmaceutical care	35 (39.3%)	17 (23.0%)	27 (30.3%)	42 (56.8%)	9 (10.1%)	6 (8.1%)	10 (11.2%)	5 (6.8%)	8 (9.0%)	4 (5.4%)	.646
[4] Pharmacy students can perform pharmaceutical care during their clerkship	**18 (20.2%)**	**7 (9.5%)**	**23 (25.8%)**	**18 (24.3%)**	**35 (39.3%)**	**31 (41.9%)**	**7 (7.9%)**	**11 (14.9%)**	**6 (6.7%)**	**7 (9.5%)**	**.034**
[5] I think the practice of pharmaceutical care is valuable	37 (41.6%)	13 (17.6%)	25 (28.1%)	39 (52.7%)	13 (14.6%)	9 (12.2%)	7 (7.9%)	6 (8.1%)	7 (7.9%)	7 (9.5%)	.058
[6] Providing pharmaceutical care takes too much time and effort [R]	2 (2.2%)	7 (9.5%)	10 (11.2%)	8 (10.8%)	27 (30.3%)	12 (16.2%)	39 (43.8%)	38 (51.4%)	11 (12.4%)	9 (12.2%)	.826
[7] I hope my pharmacy can provide pharmaceutical care	**60 (67.4%)**	**33 (44.6%)**	**7 (7.9%)**	**8 (10.8%)**	**10 (11.2%)**	**12 (16.2%)**	**8 (9.0%)**	**12 (16.2%)**	**4 (4.5%)**	**9 (12.2%)**	**.003**
[8] Providing pharmaceutical care is professionally rewarding during my clerkship	14 (15.7%)	14 (18.9%)	17 (19.1%)	17 (23.0%)	37 (41.6%)	31 (41.9%)	10 (11.2%)	4 (5.4%)	11 (12.4%)	8 (10.8%)	.246
[9] I feel that pharmaceutical care is the right direction for my career	18 (20.2%)	11 (14.9%)	35 (39.3%)	47 (63.5%)	19 (21.3%)	7 (9.5%)	9 (10.1%)	4 (5.4%)	8 (9.0%)	5 (6.8%)	.200
[10] I think providing pharmaceutical care can improve professional level of pharmacists	54 (60.7%)	34 (45.9%)	11 (12.4%)	16 (21.6%)	10 (11.2%)	12 (16.2%)	7 (7.9%)	6 (8.1%)	7 (7.9%)	6 (8.1%)	.143
[11] I feel that pharmaceutical care will improve patient health	**65 (73.0%)**	**40 (54.1%)**	**6 (6.7%)**	**10 (13.5%)**	**10 (11.2%)**	**12 (16.2%)**	**3 (3.4%)**	**6 (8.1%)**	**5 (5.6%)**	**6 (8.1%)**	**.017**
[12] I feel that practicing pharmaceutical care will benefit health care in general	56 (62.9%)	42 (56.8%)	7 (7.9%)	12 (16.2%)	10 (11.2%)	8 (10.8%)	7 (7.9%)	6 (8.1%)	9 (10.1%)	6 (8.1%)	.686
[13] Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist [R]	**7 (7.9%)**	**15 (20.3%)**	**14 (15.7%)**	**11 (14.9%)**	**16 (18.0%)**	**14 (18.9%)**	**7 (7.9%)**	**6 (8.1%)**	**45 (50.6%)**	**28 (37.8%)**	**.043**
[14] I feel proud to be a community pharmacist	24 (27.0%)	21 (28.4%)	36 (40.4%)	35 (47.3%)	10 (11.2%)	8 (10.8%)	10 (11.2%)	3 (4.1%)	9 (10.1%)	7 (9.5%)	.408

R = Reverse item

Bold values indicate $P < 0.05$

Table 4 Practice of pharmaceutical care by participant pharmacists

Item	Frequently		Usually		Unsure		Seldom		Almost never		*p*
	Chain	Independent	Chain	Independent	Chain	Independent	Chain	Independent	Chain	Independent	
[1] Communicate with patients or customers in the counseling area	55 (61.8%)	49 (66.2%)	8 (9.0%)	5 (6.8%)	24 (27.0%)	19 (25.7%)	0 (0%)	1 (1.4%)	2 (2.3%)	0 (0%)	.587
[2] Perform prescription check	**14 (15.7%)**	**5 (6.8%)**	**37 (41.6%)**	**19 (25.7%)**	**18 (20.2%)**	**21 (28.4%)**	**12 (13.5%)**	**17 (23.0%)**	**8 (9.00%)**	**12 (16.2%)**	**.002**
[3] Provide patients with direction for drug administration, dosage, and precautions	59 (66.3%)	56 (75.7%)	12 (13.5%)	6 (8.1%)	9 (10.1%)	4 (5.4%)	4 (4.5%)	3 (4.1%)	5 (5.6%)	5 (6.8%)	.262
[4] Monitor adverse drug reactions and drug compliance among patients	**19 (21.4%)**	**5 (6.8%)**	**46 (51.7%)**	**34 (46.0%)**	**8 (9.00%)**	**16 (21.6%)**	**7 (7.9%)**	**11 (14.9%)**	**9 (10.1%)**	**8 (10.8%)**	**.004**
[5] Engage in health screening activities, such as blood pressure measurement	7 (7.9%)	10 (13.5%)	8 (9.00%)	9 (12.2%)	19 (21.4%)	14 (18.9%)	44 (49.4%)	14 (18.9%)	11 (12.4%)	27 (36.5%)	.442
[6] Create a personal medication record	11 (12.4%)	9 (12.2%)	14 (15.7%)	6 (8.1%)	21 (23.6%)	15 (20.3%)	9 (10.1%)	16 (21.6%)	34 (38.2%)	28 (37.8%)	.444
[7] Conduct health education for patients	**63 (70.8%)**	**20 (27.0%)**	**9 (10.1%)**	**33 (44.6%)**	**6 (6.7%)**	**14 (18.9%)**	**6 (6.7%)**	**5 (6.8%)**	**5 (5.6%)**	**2 (2.7%)**	**.000**
[8] Provide general health information and medication information to patients	22 (24.7%)	9 (12.2%)	34 (38.2%)	33 (44.6%)	17 (19.1%)	18 (24.3%)	8 (9.0%)	11 (14.9%)	8 (9.00%)	3 (4.1%)	.214
[9] Promote drug safety knowledge outside community settings	**9 (10.1%)**	**4 (5.4%)**	**49 (55.1%)**	**10 (13.5%)**	**13 (14.6%)**	**21 (28.4%)**	**8 (8.1%)**	**33 (44.6%)**	**10 (11.2%)**	**6 (8.1%)**	**.000**

Bold values indicate $P < 0.05$

Barriers to providing pharmaceutical care

Regarding barriers hindering the provision of pharmaceutical care, the participants named the main barriers as Item [1] "Lack of physical space for pharmaceutical care provision", Item [2] The slow introduction of pharmacist law', Item [3] "Lack of patient acceptance of pharmaceutical care", and Item [4] "Lack of face-to-face communication with patient" (see "Table 5").

Participants from chain pharmacies and independent pharmacies had significantly different opinions on five barrier items: Item [1] "Lack of physical space for pharmaceutical care provision" ($p = .000$), Item [2] "The slow introduction of pharmacist law" ($p = .000$), Item [6] "Lack of effective communication skills" ($p < .017$), Item [8] "Lack of pharmaceutical supply" ($p < .043$), and Item [10] "Proprietor does not support pharmaceutical care" ($p < .000$). While the participants from independent pharmacies agreed more on the lack of physical space as a barrier, the participants from chain pharmacies tended to find the slow introduction of pharmacist law as a more relevant barrier. Moreover, the participants from chain pharmacies mostly disagreed that a lack of effective communication skills, lack of pharmaceutical supply, or lack of proprietor's support were barriers to providing pharmaceutical care.

Discussion

This study aims to measure and analyse the differences between pharmaceutical care by chain pharmacies and independent pharmacies in China by comparing the pharmacists' understanding, attitudes, practice frequency and perceived barriers of pharmaceutical care provision. Generally, the pharmacists from chain pharmacies had a relatively better understanding and attitude and practiced pharmaceutical care more frequently, which warrants further discussion.

Regarding pharmacists' understanding of pharmaceutical care, Chinese pharmacists in both types of pharmacies generally had some deficiencies in the understanding of pharmaceutical care. Pharmaceutical care is provided by pharmacists relying on professional knowledge and certain service facilities, equipment or resources to improve the patient's quality of life. The pharmaceutical care provided by pharmacists is directly responsible for patient health, which is different from pharmacy shopping guides and other sale services. The pharmacists from the two types of pharmacies in this study did not appear to completely understand the concept of pharmaceutical care with pharmacists from independent pharmacies displaying a lower level of understanding. There could be several reasons for this. First, during the period of education, pharmacy students mainly learn about drug-related knowledge and skills

Table 5 Perceived barriers to provide pharmaceutical care by participant pharmacists

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		*p*
	Chain	Independent	Chain	Independent	Chain	Independent	Chain	Independent	Chain	Independent	
[1] Lack of physical space for pharmaceutical care provision	**3 (3.4%)**	**5 (6.8%)**	**11 (12.4%)**	**47 (63.5%)**	**14 (15.7%)**	**8 (10.8%)**	**49 (55.1%)**	**7 (9.5%)**	**12 (13.5%)**	**7 (9.5%)**	**.000**
[2] The slow introduction of pharmacist law	**14 (15.7%)**	**4 (5.41%)**	**52 (58.43%)**	**7 (9.46%)**	**8 (8.99%)**	**37 (50%)**	**7 (7.87%)**	**10 (13.51%)**	**8 (8.99%)**	**16 (21.62%)**	**.000**
[3] Lack of patient acceptance of pharmaceutical care	9 (10.1%)	11 (14.9%)	30 (33.7%)	20 (27.0%)	32 (36.0%)	23 (31.1%)	9 (10.1%)	11 (14.9%)	9 (10.1%)	9 (21.6%)	.749
[4] Lack of face-to-face communication with patient	5 (5.6%)	4 (5.4%)	14 (15.7%)	10 (13.5%)	24 (27.0%)	12 (16.2%)	36 (40.5%)	40 (54.1%)	10 (11.2%)	8 (10.8%)	.255
[5] Lack of time to provide pharmaceutical care	24 (27.0%)	12 (16.2%)	44 (49.4%)	48 (64.9%)	10 (11.2%)	5 (6.8%)	4 (4.5%)	3 (4.1%)	7 (7.9%)	6 (8.1%)	.512
[6] Lack of effective communication skills	**6 (6.7%)**	**6 (8.1%)**	**10 (11.2%)**	**6 (8.1%)**	**17 (19.1%)**	**36 (48.7%)**	**48 (53.9%)**	**20 (27.0%)**	**8 (9.0%)**	**6 (8.1%)**	**.017**
[7] Lack of knowledge concerning drug use	13 (14.6%)	10 (13.5%)	11 (12.4%)	8 (10.8%)	24 (27.0%)	16 (21.6%)	32 (36.0%)	31 (41.9%)	9 (10.1%)	9 (21.6%)	.404
[8] Lack of pharmaceutical supply	**12 (13.5%)**	**7 (9.5%)**	**12 (13.5%)**	**13 (17.6%)**	**15 (16.9%)**	**36 (48.7%)**	**38 (42.7%)**	**8 (10.8%)**	**12 (13.5%)**	**10 (13.5%)**	**.043**
[9] Insufficient communication with physicians	11 (12.4%)	7 (9.5%)	27 (30.3%)	22 (29.7%)	29 (32.6%)	32 (43.2%)	10 (11.2%)	5 (6.86%)	12 (13.5%)	8 (10.8%)	.968
[10] Proprietor does not support pharmaceutical care	**12 (13.5%)**	**13 (17.6%)**	**12 (13.5%)**	**21 (28.4%)**	**19 (21.4%)**	**21 (28.4%)**	**6 (6.7%)**	**11 (14.9%)**	**40 (44.9%)**	**8 (10.8%)**	**.000**
[11] Other health professionals do not support pharmaceutical care	8 (8.99%)	5 (6.76%)	8 (8.99%)	9 (12.16%)	22 (24.72%)	9 (12.16%)	14 (15.73%)	13 (17.57%)	37 (41.57%)	38 (51.35%)	.227

Bold values indicate $P < 0.05$

but not patient-centred service [29, 30]. Second, the examination threshold of licensed pharmacists in China is not high and is mainly focused on pharmaceutical knowledge rather than service mindset and skills [31]. Consequently, even pharmacists who pass the licensing examination might not have the comprehensive and systematic understanding of pharmaceutical care. The shift of the pharmacy education system and the pharmacist licensing system from a drug-oriented to a pharmaceutical-care-oriented approach is needed to improve the community pharmacists' understanding of pharmaceutical care.

In China, chain pharmacies usually have higher recruitment standards and more systematic training systems for the employed pharmacists. Thus, pharmacists at chain pharmacies might have more chances to increase their understanding of pharmaceutical care. Adopting rigorous recruitment mechanisms or providing advanced training programs may improve the pharmacist staff's understanding of pharmaceutical care in independent pharmacies. In addition, regarding the role of patients in pharmaceutical care, compared with pharmacists at chain pharmacies, pharmacists at independent pharmacies clearly underestimated or neglected the role and functions of patients in pharmaceutical care. During the course of pharmaceutical care, patients should actively cooperate with pharmacists to complete the service process. The exchange, trust and feedback between patient and pharmacist are considered important factors affecting the output of pharmaceutical care [32].

Regarding the pharmacists' attitudes toward pharmaceutical care in the two types of pharmacies, the results showed that most Chinese pharmacists reported a positive attitude towards pharmaceutical care. However, there were still some differences between pharmacists in the different types of pharmacies. First, pharmacists in chain pharmacies tended to provide pharmaceutical care rather than drug shopping guides and other services. At the same time, the pharmacists in chain pharmacies had a higher recognition of the value of pharmaceutical care and had more intention to provide pharmaceutical care in their working pharmacies. Apart from the differences in the training systems of the two types of pharmacies, the above phenomenon might also stem from the differences in the nature of their businesses. The financial situation of chain pharmacies in China is likely to be more stable than that of independent pharmacies [33]. The operating income pressure for chain pharmacies is relatively smaller compared to that for independent pharmacies. To control the fluctuations in operating income constantly experienced by independent pharmacies, they might need to rely on revenue-generating business-type services and allocate fewer resources to support the provision of professional pharmaceutical care for which there is no remuneration mechanism.

Regarding the practice of pharmaceutical care, Chinese pharmacists in both types of pharmacies were mostly involved in basic customer consultations and medication guidance, but not advanced pharmaceutical care, which was more obvious among pharmacists at independent pharmacies. This might be caused by the excessive profit orientation of community pharmacies in China [34]. To enable the provision of quality pharmaceutical care, pharmacists should be allowed to liberate themselves from traditional drug sale activities and attend more to solving the actual needs of their patients. Particularly, community pharmacists need to transform their role from "retailer" to health care provider [35]. To facilitate the role transformation, policy makers should recognize and help to manage the tension between being retailers and healthcare providers for pharmacists in community pharmacies [36].

To our knowledge, this is the first empirical study about pharmaceutical care at chain pharmacies and independent pharmacies in China. It has two main implications for health policy makers in China. First, pharmacists in both chain pharmacies and independent pharmacies should be given opportunities to provide pharmaceutical care. Second, policies are needed to improve the current remuneration model of community pharmacies to support the provision of pharmaceutical care by community pharmacists. However, this study has some limitations that could be addressed in a future study. First, as community pharmacies have divided business models and management systems, further study into the nature of the business of pharmaceutical care is needed. Second, more innovative intervention studies to improve community pharmacists' pharmaceutical care should be piloted. In particular, how to transform community pharmacies from drug stores to professional pharmaceutical care units warrant more exploration. Third, the positioning of chain pharmacies and independent pharmacies requires evaluation from a national- or regional-health-system point of view. Further comparative studies of different health systems beyond China can generate a deeper understanding of how the co-existence of chain pharmacies and independent pharmacies can contribute to health systems.

Conclusion

Compared with pharmacists at chain pharmacies, pharmacists at independent pharmacies faced more challenges when trying to provide pharmaceutical care. Specific efforts should be taken to improve pharmacist competence, increase patient acceptance and shape a better operative environment for community pharmacies, especially the independent pharmacies.

Acknowledgements The authors thank all the data collection assistants who provided help in data collection.

Funding The authors received no specific funding for this work.

Conflicts of interest All the authors declare that they have no conflict of interest.

References

1. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. Am J Hosp Pharm. 1990;47(3):533–43.
2. Briesacher B, Corey R. Patient satisfaction with pharmaceutical services at independent and chain pharmacies. Am J Health Syst Pharm. 1997;54(5):531.
3. Kalsekar I, Sheehan C, Peak A. Utilization patterns and medication adherence in patients with type 2 diabetes: variations based on type of pharmacy (chain vs. independent). Res Soc Adm Pharm. 2007;3(4):378–91.
4. Fang Y, Yang S, Zhou S, Jiang M, Liu J. Community pharmacy practice in China: past, present and future. Int J Clin Pharm. 2013;35(4):520–8.
5. Lv B, Yao F, Wang L, Gao W, Yang Q, Yang C, et al. Comparison of retail pharmacies supervision and pharmaceutical care mode between China and some countries and regions. Chin Pharm. 2016;4:569–72 **(in Chinese)**.
6. Fang Y, Yang S, Feng B, Ni Y, Zhang K. Pharmacists' perception of pharmaceutical care in community pharmacy: a questionnaire survey in Northwest China. Health Soc Care Commun. 2011;19(2):189–97.
7. Song M, Ung CO, Hu H, Wang Y. Community pharmacists' perceptions about pharmaceutical care of OTC western medicine: a survey in Harbin of China. Int J Clin Pharm. 2015;37(6):1014.
8. Wang Y, Pan Z, Lv C. Discussion on how to improve the pharmaceutical service level of retail pharmacy in China. J Clin Med Lit. 2015;21:4514–6 **(in Chinese)**.
9. Chinese Domestic Trade Department, Strategic Opinions on Operational Management of Chain Stores (Internal Trade Politics Law [1997] No. 24),1997-03-27.
10. Li Y. Local legislation study on the supervision and administration of pharmaceutical retailers—taking shanghai as research objects. Shanghai: Fudan University; 2008.
11. Annual Report 2016 Annual Statistics Food and Drug Administration. China Food and Drug Administration, http://xxgk.gdda.gov.cn/publicfiles/business/htmlfiles/gddaxxgk/s4765/201706/339371.htm. Accessed 25 June 2018.
12. Jin Z, Zheng M, Zhang J, Zhao M. Investigation on pharmaceutical care of chain drug stores in Chengdu from the consumers' angle. Chin Pharm. 2017;30:4194–7 **(in Chinese)**.
13. El Hajj MS, Al-Saeed HS, Khaja M. Qatar pharmacists' understanding, attitudes, practice and perceived barriers related to providing pharmaceutical care. Int J Clin Pharm. 2016;38(2):330–43.
14. Dunlop JA, Shaw JP. Community pharmacists' perspectives on pharmaceutical care implementation in New Zealand. Pharm World Sci. 2002;24(6):224–30.
15. Rossing C, Hansen EH, Krass I. The provision of pharmaceutical care in Denmark: a cross-sectional survey. J Clin Pharm Ther. 2003;28(4):311–8.
16. Mehralian G, Rangchian M, Javadi A, Peiravian F. Investigation on barriers to pharmaceutical care in community pharmacies: a structural equation model. Int J Clin Pharm. 2014;36(5):1–8.
17. Uema SA, Vega EM, Armando PD, Fontana D. Barriers to pharmaceutical care in Argentina. Pharm World Sci. 2008;30(3):211–5.
18. Aburuz S, Al-Ghazawi M, Snyder A. Pharmaceutical care in a community-based practice setting in Jordan: where are we now with our attitudes and perceived barriers? Int J Pharm Pract. 2012;20(2):71–9.
19. Ngorsuraches S, Li SC. Thai pharmacists' understanding, attitudes, and perceived barriers related to providing pharmaceutical care. Am J Health Syst Pharm. 2006;63(21):2144.
20. Hughes CM, Hawwa AF, Scullin C, Anderson C, Bernsten CB, Björnsdóttir I, et al. Provision of pharmaceutical care by community pharmacists: a comparison across Europe. Pharm World Sci. 2010;32(4):472–87.
21. Rossing C, Hansen EH, Traulsen JM, Krass I. Actual and perceived provision of pharmaceutical care in Danish community pharmacies: the pharmacists' opinions. Pharm World Sci. 2005;27(3):175–81.
22. Bell HM, McElnay JC, Hughes CM, Woods A. Provision of pharmaceutical care by community pharmacists in Northern Ireland. Am J Health Syst Pharm. 1998;55(19):2009–13.
23. Chisholm MA, Martin BC. Development of an instrument to measure student attitudes concerning pharmaceutical care. Am J Pharm Educ. 1997;61(4):374–9.
24. Tang G, Li D, Yuan S. Good pharmacy practice (2005 edition) (part 1). Chin J Hosp Pharm. 2006;26(5):503–6 **(in Chinese)**.
25. Tang G, Li D, Yuan S. Good pharmacy practice (2005 edition) (part 2). Chin J Hosp Pharm. 2006;6:643–50 **(in Chinese)**.
26. Tang G, Li D, Yuan S, Chang M, Zhu Z, Lu L, et al. Good pharmacy practice (2005 edition)(part 3). Chin J Hosp Pharm. 2006;26(7):783–5.
27. Brown CM, Barner JC, Shepherd MD. Issues and barriers related to the provision of pharmaceutical care in community health centers and migrant health centers. J Am Pharm Assoc. 2003;43(1):75–7.
28. American Society of Health-System Pharmacists. ASHP guidelines on a standardized method for pharmaceutical care. Am J Health Syst Pharm. 1996;53(14):1713–6.
29. Zhang F, Xu X. Comparative analysis of Chinese and Canadian clinica pharmacy curricula. Pharm Educ. 2017;33(3):30–4 **(in Chinese)**.
30. Tan L, Wei J, Pan Y, Liu W, Yang B, Liu L, et al. Discussion on the teaching reform of clinical pharmacy undergraduate course. Educ Teach Forum. 2017;24:241–2 **(in Chinese)**.
31. Chen X, Zhang G, Li Y, Zhao Y. Problems and countermeasures of qualification regulation of licensed pharmacists in China. Med Soc. 2017;30(1):15–8 **(in Chinese)**.
32. Worley MM, Schommer JC, Brown LM, Hadsall RS, Ranelli PL, Stratton TP, et al. Pharmacists' and patients' roles in the pharmacist-patient relationship: are pharmacists and patients reading from the same relationship script? Res Soc Adm Pharm. 2007;3(1):47–69.
33. Gong S, Mo Z. Living situation and survival strategies of the retail pharmacy in modern business and New Medical Reform. Manag Obs. 2015;31:166–8 **(in Chinese)**.
34. Jin Z, Ma Y, Gu J, Xue W, Zhao M. Investigate and analysis on weakening of pharmacy service function in drugstores. Chin Pharm. 2014;12:12–4 **(in Chinese)**.
35. Mossialos E, Courtin E, Naci H, Benrimoj S, Bouvy M, Farris K, et al. From, "retailers" to health care providers: transforming the role of community pharmacists in chronic disease management. Health Policy. 2015;119(5):628–39.
36. Scahill SL, Tracey MS, Sayers JG, Warren L. Being healthcare provider and retailer: perceiving and managing tensions in community pharmacy. J Pharm Pract Res. 2018;48(3):251–61.