

Pharmacists' perception of pharmaceutical care in community pharmacy: a questionnaire survey in Northwest China

Yu Fang PhD MS, Shimin Yang BS, Bianling Feng MS, Yufei Ni BS and Kanghuai Zhang MS

Department of Pharmacy Administration, Faculty of Pharmacy, School of Medicine, Xi'an Jiaotong University, Xi'an, China

Accepted for publication 20 July 2010

Correspondence

Yu Fang PhD, Department of Pharmacy Administration, Faculty of Pharmacy, School of Medicine, Xi'an Jiaotong University, 76 Yanta West Road, Xi'an 710061, China.
E-mail: yufang@mail.xjtu.edu.cn

What is known about this topic

- Pharmaceutical care is the responsible provision of drug therapy for the purpose of achieving definite outcomes which improve a patient's quality of life.
- There is little information available in the literature about the extent of pharmaceutical care provision and barriers to the provision in China.

What this paper adds

- Community pharmacists in China appear to be deeply rooted in the traditional role of medication dispensing and counselling.
- The perceived barriers to implementing pharmaceutical care in Chinese community pharmacies were lack of external conditions for providing pharmaceutical care, lack of time and skills, absence of information and economic incentive, and lack of full support from other health professionals.

Abstract

The aim of this study was to explore the perceptions of community pharmacists towards the concept of pharmaceutical care, implementing frequencies of pharmaceutical care, and barriers to implementation of pharmaceutical care in China. A 38-item self-completion pre-tested questionnaire was administered to a quota sample of 130 pharmacists in community pharmacies in Xi'an, Shaanxi Province, northwest China in April 2008. Main outcome measures included understanding of pharmaceutical care; perceived frequency of pharmaceutical care activities; attitude towards pharmaceutical care; barriers to implementation of pharmaceutical care. A response rate of 77.7% (101/130) was achieved. The data were analysed descriptively. Factor analysis was used to explore potential barriers to the provision of pharmaceutical care. Respondents' understanding of the definition of pharmaceutical care was not entirely satisfactory: it was widely but incorrectly seen as a medication counselling service and many pharmacists appeared to misunderstand their role in the process. Respondents spent most of their work time performing prescription checks and providing patients with directions for drug administration, dosage, and precautions, but they tended to ignore health promotion within and outside of pharmacy settings. Factor analysis suggested four factors influencing the implementation of pharmaceutical care in the surveyed community pharmacies: lack of external conditions for developing or providing pharmaceutical care, lack of time and skills, absence of information and economic incentive, and lack of full support from other health professionals, with a cumulative variance of 64.7%. Cronbach's alpha for the four factors was 0.71, 0.72, 0.69 and 0.74, respectively. Although the respondent pharmacists had a certain degree of understanding of the definition, aim, function and use of pharmaceutical care, and carried out some activities currently, a range of barriers need to be overcome before comprehensive pharmaceutical care becomes a reality in China. These barriers could be overcome through participation in effective continuing educational programmes, availability of more resources, effective collaboration with other health professionals.

Key words: attitude, barriers, China, community pharmacists, pharmaceutical care, perception

Introduction

Pharmaceutical care, started in the nineties in the United States, was defined by Hepler & Strand (1990) as 'the

responsible provision of drug therapy for the purpose of achieving definite outcomes which improve a patient's quality of life'. Thus, the actions taken in the practice of pharmaceutical care were centred around minimising

drug related problems and achieving optimal use of medicines by the patient (Rovers *et al.* 1998).

Much progress has been achieved since the introduction of pharmaceutical care in 1990 but there are still barriers that hinder the provision of this service that have to be overcome (Martín-Calero *et al.* 2004). Time is said to be a major barrier in Europe (Van Mil & Schulz 2006). In the Netherlands not all pharmacies provide pharmaceutical care at the same level for new entrants into the market. For example, supermarkets and pharmacy chains, seem to put little emphasis on care provision (Van Mil 2005). Pharmaceutical care has only been implemented in Denmark to a limited extent (Rossing *et al.* 2005); the lack of proper readiness of pharmacists is one of the main barriers to providing pharmaceutical care (Rossing *et al.* 2003). The identification, resolution, and documentation of drug related problems are central to community pharmacy practice in Sweden. Current threats to pharmaceutical care practice include organisational changes, budget cuts and reduced manpower (Westerlund & Björk 2006). Community pharmacies in Germany are moving from the image of mainly supplying drugs toward the provision of cognitive pharmaceutical services (Eickhoff & Schulz 2006). The implementation of pharmaceutical care in Canadian community pharmacies continues to become more widespread. However, barriers to the provision of pharmaceutical care in Canada exist too, including the current shortage of pharmacists and lack of reimbursement systems for cognitive services (Jones *et al.* 2005). Dunlop & Shaw (2002) identified significant barriers to implementation of pharmaceutical care in New Zealand: insufficient time came first, followed by absence of a reimbursement system, lack of therapeutic knowledge and clinical problem solving skills. Surachat & Shu (2006) identified the perceived barriers to pharmaceutical care provision in Thailand as a lack of external cooperation, knowledge and skills, initiatives and resources. In Brazil, numerous barriers to the development of pharmaceutical care remain, the main ones being the commercial objective of most pharmacies that sell medications and the insufficient training of professionals (De Castro & Correr 2007).

Pharmaceutical care practices all over the world are quite diverse because of the different languages and legal, political and healthcare systems in the nations involved (Van Mil & Schulz 2006). As for China, pharmaceutical care as a practice philosophy was firstly introduced in this country in the mid-1990s, and the implementation of pharmaceutical care in Chinese hospital pharmacies continues to become widespread. However, pharmaceutical care has not been a priority of routine pharmacy practice in community pharmacy settings. Benefitting from Chinese health care system reform, there has been an increase in the number of

community pharmacies. As of September 2006, there were nearly 341 000 community pharmacies in China (State Food and Drug Administration 2008). Relative to the Chinese population, there are 4063 people per community pharmacy (Chinese Pharmaceutical Yearbook Editorial Committee 2007), but the number of licensed pharmacists was only 162 632 in 2008, and the total ratio of pharmacists to 100 000 population was 12.2, much lower than 88.5 in the United States, 92.7 in Canada, and other developed countries such as Singapore with 30.0 per 100 000 population.

There are two main streams of pharmaceutical practice in China, traditional Chinese medicine and modern pharmacy. Hospital and community pharmacies are responsible for the dispensing of medicinals used for both streams of pharmaceutical practice. Pharmacists in China typically compound and dispense medications following prescriptions issued by physicians, dentists, or other authorised medical practitioners. In this role pharmacists act as a learned intermediary between physicians and patients and thus ensure the safe and effective use of medications. In the near future pharmacists are expected to be involved more in pharmaceutical care with their particular knowledge and skills rather than only dispensing medication and other routine duties. Furthermore, Chinese pharmacists indicated a willingness to implement pharmaceutical care but had limited knowledge and skill of pharmaceutical care and under-developed pharmacy education contributed to this problem. In addition, there was no programme for paying pharmacists for cognitive services, and this lack of reimbursement discouraged pharmacists' enthusiasm to offer patient services.

The Fourth Chinese National Health Care Survey revealed a high prevalence rate of self-medication among the population in China, surging from 36% in 2003 to 70% in 2008 (The Ministry of Health 2009). The data reinforce the responsibility of community pharmacies and pharmacists in preventing patients from drug related problems when practising self-medication. However, there is little information available in the literature about the extent of pharmaceutical care provision and barriers to the provision in the most populated country in the world. Thus, the objectives of this study were to examine the extent of pharmaceutical care practice and the barriers to the provision of pharmaceutical care as perceived by practicing pharmacists in community pharmacies in China.

Conceptual framework

The conceptual framework used in this study is the pharmaceutical care model initially defined by Hepler & Strand (1990). Since then, it is generally accepted that the

focus of pharmacists should shift from providing medicinal products to ensuring the best drug therapy and patient safety. Nowadays, pharmaceutical care has become a dominant form of practice for thousands of pharmacists around the world, especially in developed countries. According to this concept, the patient care process in pharmaceutical care includes establishment of a therapeutic relationship, assessment (including identification of drug related problems), development of a care plan, evaluation and continuous follow-up.

The primary components of the model were identification, analysis, prevention and resolution of drug related problems, patient counselling on their medications and diseases, and interaction with the medical team (Cipolle *et al.* 2004). Recent evidence has shown that pharmaceutical care services delivered by pharmacists improved patients' clinical, humanistic and economic outcomes (Berenguer *et al.* 2004).

Methods

This study involved a survey of practicing licensed pharmacists at community pharmacies in Xi'an, the capital city of Shaanxi Province, northwest China. The survey was conducted in April 2008. In accordance with the policies and procedures of Shaanxi Licensed Pharmacists Association, ethics approval was applied for and granted by Shaanxi Licensed Pharmacists Association's Academic Ethics Board for the questionnaire survey.

Survey instruments

On the basis of the pharmaceutical care model (Hepler & Strand 1990), and the specific pharmaceutical care practices conducted in China, a self-completion questionnaire was developed to meet the objectives of the study. The questionnaire was developed originally in Chinese. To ensure that an English equivalent would be produced, the questionnaire was translated by two independent Chinese native speakers fluent in English, then back-translated by two independent English speakers fluent in Chinese. Group discussions between the two independent translators for each phase and the main researcher were held intermediately to reach consensus on the best wording. The authors of the original survey reviewed the back-translation, ensuring semantic equivalence.

The questionnaire consisted of five sections. The first section collected data on the sex and age of the pharmacist, the type of practice, the number of years worked in the pharmacy and the type of post. In the second section, pharmacists were asked to respond to six statements about the concept, purpose and function of pharmaceutical care and the pharmacist's role in the pharmaceutical care process, two of which were false statements.

The statements were rated on a 5-point Likert scale ranging from 1 = not at all to 5 = very much. In the third section, pharmacists were asked to report the frequency of each of the nine pharmaceutical care activities applied to their pharmacy practice using the scale 1 = never through 5 = always. These activities included drug therapy problem identification, drug therapy problem solving, follow-up evaluation, documentation in practice, and others (health education and health promotion). In the fourth section, pharmacists' attitudes to pharmaceutical care were surveyed. This section contained seven statements dealing with the perceptions pharmacists may have by using a 5-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. In the last section, pharmacists were required to respond to 11 statements outlining possible barriers to the provision of pharmaceutical care. The items were measured using a 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree.

The items of the original scales were derived from the content analyses of focus-group discussion regarding pharmaceutical care and influencing barriers, and a selected item pool from well-established measures regarding pharmaceutical care and hindering barriers in both developed and underdeveloped countries. After the questionnaire was developed, content and format were evaluated using a pretest involving a convenience sample of 10 community pharmacists. In the pre-test, pharmacists were asked to provide feedback on the design of the questionnaire, its relevance, and the flow of individual questions between sections. Comments were also obtained from two senior academic pharmacists from Shaanxi Licensed Pharmacists Association and two faculties of pharmacy, School of Medicine, Xi'an Jiaotong University.

Subjects

The participants of this study were licensed pharmacists at independent pharmacies, chain pharmacies and supermarket pharmacies in Xi'an, which is a moderately developed city in China. Xi'an pharmacists were considered to represent an average level of pharmaceutical care in China (China Licensed Pharmacist Association 2008).

Data collection

A descriptive cross-sectional survey was administered to a quota sample of licensed pharmacists at community pharmacies in Xi'an, which allowed the researchers to specify the number of sampling units they wanted in each category (i.e. pharmacy type, geographic location). The sample was pre-determined to match the actual percentages of the different types of community pharmacy in Xi'an (62% independent pharmacies, 29% chain

pharmacies, 9% others, including mass merchants and supermarkets). To improve the representativeness of pharmacies enrolled in this study, we used a regional map to locate pharmacies in each of the nine districts of Xi'an. Pharmacies conducting pharmaceutical care were selected according to the information offered by the China Licensed Pharmacist Association (2008). Finally 130 pharmacies conducting pharmaceutical care were identified as the quota needed to represent the combination of location (the nine districts of Xi'an) and type of pharmacy. Questionnaires were sent to 130 pharmacists working in these selected pharmacies, of which 80 worked in chain pharmacies, 38 in independent pharmacies and 12 in others such as mass merchant, supermarket. Informed consent was obtained prior to each participant's involvement in the survey.

To increase the response rate, the questionnaires were sent to pharmacists and collected face-to-face by investigators. Respondents were told in a covering letter that the information they provided would be anonymous and would be gathered for the purposes of research.

Data analysis

All analyses were performed with SPSS Release 14.0. In the case that respondents did not complete all sections of the questionnaire, a missing value was entered into the database and the response was excluded from the analysis. Pharmacists' demographic characteristics, their understanding and perceived frequency of pharmaceutical care provision, their attitudes towards pharmaceutical care and perceived barriers to the provision of pharmaceutical care were analysed descriptively.

Reliability of the instrument's four main scales was assessed with Cronbach's alpha. Exploratory factor analysis was used to assess the dimensionality of the 11-item scale for perceived barriers to the provision of pharmaceutical care. Given the size of the sample, factor analysis results should be interpreted with caution, although Tabachnick & Fidell (2001) comment that a sample size of 150 may be sufficient when several factors have loadings >0.80. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were applied to determine whether the data were suitable for factor analysis (Field 2005). Principal components extracting factors with varimax rotation was applied. Varimax rotation was used for this analysis to maintain orthogonality of factors and to have items load highly on a given factor. Initial factors were extracted according to the Kaiser criterion of retaining eigenvalues larger than 1.00 (Lewis-Beck 1994). Items used to measure each dimension should have high factor loadings (>0.40) for the dimension they were designed to measure.

Results

Demographics

Of the total of 130 questionnaires sent out, there were 110 usable returns (84.6% response rate). Nine questionnaires were subsequently excluded because of incomplete data, and the final response rate was 77.7% (101/130). Demographics of respondents are listed in Table 1.

The respondents were primarily female (82.2%) and most were aged 50 or less (94.1%). Most participants worked in a pharmacy chain (63.4%) and on average, participants had been working in a pharmacy for just over 7 years.

Pharmacists' understanding of pharmaceutical care

Table 2 illustrates that the respondents' understanding of the definition of pharmaceutical care was not entirely satisfactory. The response to statement 2, with 96.0% agreeing or strongly agreeing, showed that pharmacists had a certain degree of understanding of the aim of pharmaceutical care. The function and use of pharmaceutical care provided by pharmacist were assessed using statements 4 and 5, both of which were understood by around 90% of pharmacists. Statements 3 and 6 were two false items to tests the respondents' replies. Allowing for a potential bias towards positive responses, responses to these statements suggested that there

Table 1 Demographic profile of the respondents (*n* = 101)

Demographic profile	<i>n</i> (%)
Sex	
Male	18 (17.8)
Female	83 (82.2)
Age (years)	
21–30	17 (16.8)
31–40	48 (47.5)
41–50	30 (29.7)
>50	6 (5.9)
Type of practice	
Independent pharmacy	29 (28.7)
Pharmacy chain	64 (63.4)
Supermarket pharmacy	8 (7.9)
Years working in pharmacy	
≤10	85 (84.2)
10–20	13 (12.8)
≥20	3 (3.0)
Mean (SD)	7.3 (5.5)
Working position	
Quality assurance	29 (28.7)
Prescription checking	38 (37.6)
Others (staff management, training, etc.)	34 (33.7)

Table 2 Pharmacists' understanding of pharmaceutical care ($n = 101$)

Statement	Agree and strongly agree (%)	Perceived understanding*	
		Mean	SD
1. Pharmaceutical care is the responsible provision of drug therapy	68.3	3.7	1.0
2. The aim of pharmaceutical care is to ensure the safety, efficacy, economy and rational use of medicines	96.0	4.4	0.8
3. Pharmaceutical care is just a medication counselling service	84.2	3.9	0.9
4. Pharmaceutical care provides a feedback to optimise drug use	87.1	4.2	0.8
5. All patients taking medicines require pharmacists' help	92.1	4.2	0.7
6. The pharmacist plays secondary role in the pharmaceutical care process	72.2	3.8	1.0

*A 5-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, and 5 = strongly agree. Cronbach's $\alpha = 0.72$.

may be some confusion regarding the pharmacists' understanding of the emphasis of pharmaceutical care and their role in the process. Cronbach's alpha over the six statements was 0.72.

Perceived frequency of community pharmacy services provision

Table 3 lists the results of respondents' perceived frequency of community pharmacy services provision. More than 90% of respondents reported spending some or most of their time performing prescription checks or providing patients with directions for drug administration, dosage and precautions. In contrast, just over half the respondents reported monitoring adverse drug

reaction and drug compliance among patients. They were also poor at conducting health education and promoting patients' drug safety knowledge within and outside of community pharmacy settings. Nevertheless, Cronbach's alpha across the nine statements was 0.80.

Pharmacists' attitudes to pharmaceutical care

The seven statements used for this analysis were intended to determine the attitude of pharmacists towards pharmaceutical care provision. On the whole, pharmacists had very positive attitudes to pharmaceutical care (Table 4). Cronbach's alpha across the seven statements was 0.71. The statement with least agreement concerned working conditions, where just over half

Table 3 Perceived frequency of pharmaceutical care provision ($n = 101$)

Statement	Some of the time and most of the time (%)	Perceived extent*	
		Mean	SD
Drug therapy problem identification			
1. Communicate with patients or customers in the counselling area	87.1	4.1	0.9
2. Perform prescription check	93.1	4.5	0.9
Drug therapy problem solving			
3. Provide patients with direction for drug administration, dosage, and precautions	94.1	4.5	0.9
Follow-up evaluation			
4. Monitor adverse drug reaction and drug compliance among patients	56.5	3.3	1.2
5. Engage in health screening activities, such as blood pressure measurement	50.5	3.2	1.1
Documentation in practice			
6. Create a personal medication record	84.1	4.1	1.1
Others (health education and health promotion)			
7. Conduct health education for patients	19.8	2.7	1.0
8. Provide general health information and medication information to patients	44.5	3.0	1.2
9. Promote drug safety knowledge outside community settings	8.9	2.3	0.9

*A 5-point Likert scale, where 1 = never, 2 = rarely, 3 = not sure, 4 = some of the time, and 5 = most of the time. Cronbach's $\alpha = 0.80$.

Table 4 Pharmacists' attitudes to pharmaceutical care ($n = 101$)

Statement	Agree and strongly agree (%)	Perceived attitude*	
		Mean	SD
1. I think that maintaining patients' health is my primary responsibility	98.0	4.5	0.6
2. I try my best to provide patients with suitable medicines	99.0	4.5	0.5
3. I will consider patients' economic situation in the process of pharmaceutical care provision	91.1	4.2	0.7
4. I can provide much more comprehensive pharmaceutical care than provided now	74.3	4.0	0.8
5. I would like to provide pharmaceutical care but simply lack basic working conditions	56.4	3.5	1.2
6. Providing pharmaceutical care offers me job satisfaction	89.1	4.0	1.0
7. I think patients are looking forward to my provision of pharmaceutical care	89.1	4.2	0.6

*A 5-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, and 5 = strongly agree. Cronbach's $\alpha = 0.71$.

agreed or strongly agreed that they would like to provide pharmaceutical care but lacked the basic working conditions to do so.

Barriers to the provision of pharmaceutical care

The statements listed in Table 5 were possible factors that may have influenced respondents' provision of pharmaceutical care. The KMO value was 0.70, which is considered middling (Sharma 1996). The test statistic for Bartlett's test of sphericity was 243.3 (d.f.=55, $P < 0.001$), indicating that the correlation matrix came from a population of variables that were not independent. The factor analysis yielded four factors which accounted for 64.7% of the total variance. Cronbach's alpha for all 11 statements was 0.74, and 0.71, 0.72, 0.69 and 0.74 for the four factors, respectively.

The first factor, lack of external conditions for developing or providing pharmaceutical care, accounted for 24.2% of the total variance while the second factor, lack of time and skills, the third factor, lack of information and economic incentive, and the fourth factor, lack of support from other health professionals, accounted for 19.9%, 11.3% and 9.3% of the total variance, respectively.

Discussion

The results presented in Table 2 suggest a strong tendency to agree with all the statements. This may be the results of social desirability bias, that is, participants may have wanted to give a positive answer so that they seemed supportive of the researchers and pharmaceutical care. Nevertheless, the measurement results of two false items in the questionnaire suggested community

Table 5 Perceived barriers to the provision of pharmaceutical care ($n = 101$)

Factor	Item	Agree and strongly agree (%)	Perceived barriers*		Factor loading [†]
			Mean	SD	
Lack of external conditions for developing or providing pharmaceutical care	Lack of physical space for pharmaceutical care provision	69.3	3.6	0.9	0.82
	The slow introduction of pharmacists' law	63.4	3.8	0.9	0.74
	Lack of patient acceptance of pharmaceutical care	63.3	3.7	0.8	0.62
Lack of time and skills	Lack of time to provide pharmaceutical care	54.4	3.3	1.2	0.82
	Lack of face to face communication with patient	23.8	2.7	1.0	0.77
	Lack of effective communication skills	31.7	2.8	1.2	0.64
Lack of information and economic incentive	Lack of knowledge concerning drug use	34.6	3.2	1.2	0.82
	Lack of compensation for pharmaceutical care provision	82.2	4.0	0.8	0.71
	Insufficient communication with physician	75.3	3.9	0.9	0.59
Lack of support from other health professionals	Proprietor does not support pharmaceutical care	25.7	2.6	1.2	0.84
	Other health professionals do not support pharmaceutical care	16.9	2.7	0.9	0.73

*A 5-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, and 5 = strongly agree.

[†]Cronbach's alpha for all 11 statements was 0.74, and 0.71, 0.72, 0.69 and 0.74 for the four factors, respectively. Kaiser–Meyer–Olkin measurement of sampling adequacy = 0.70, Bartlett's test of sphericity chi-square = 243.2 (d.f. = 55, $P < 0.001$).

pharmacists in China had an unsatisfactory understanding towards the role of pharmacist and the emphasis of pharmaceutical care. It should be a key concern for the Chinese government and pharmacists' associations that understanding among community pharmacists towards pharmaceutical care is generally unsatisfactory.

The present study found that respondents often became involved in drug therapy problem identification, performing a prescription check and providing patients with directions for drug use. However, they seldom conducted follow-up evaluation to optimise drug therapy outcomes. Thus, the pharmaceutical care processes often ended after the pharmacist's first encounter with a patient. Another problem with the pharmaceutical care services is the role holders generally deny their responsibility in health promotion and education. This may be caused by pharmacists' low level of motivation and commitment, and self-confidence to assume responsibility for patients' health.

This study showed that most respondents adopt pharmaceutical care by thinking that pharmaceutical care is patient-centred, outcome-oriented pharmacy practice, and they are willing to try their best to assess, initiate, monitor, and modify medication to ensure that drug therapy regimens are safe and effective. However, it also shows that good working conditions offered by community pharmacies may contribute to the quality of pharmaceutical care service and pharmacists can play a greater role in this process. Therefore, it is important for the government, pharmacy organisations, and proprietors of community pharmacies to create a sound environment for the development of pharmaceutical care in China.

With regards to the respondents' perceived barriers to pharmaceutical care provision, the factors describing the perception of barriers can be divided into internal and external, depending on the pharmacists' responses. An example of an external barrier is 'lack of patient acceptance of pharmaceutical care'; an example of an internal barrier is 'lack of effective communication skills'. It is remarkable that lack of external conditions for developing or providing pharmaceutical care was perceived as the greatest barrier to implementation of pharmaceutical care. The most frequently-mentioned and important external constraint was 'lack of physical space for pharmaceutical care provision'. This may be caused by the unsatisfactory management of the pharmacy (the owner) and possibly the government as well. 'The slow introduction of pharmacists' law' is an example of a legislation-related external constraints, the lack of appropriate legislation regarding pharmacist and pharmaceutical care is a significant deterrent to undertaking pharmaceutical care in China. Pharmaceutical care in China is still in its initial stage, which was described to some extent

by the rather low level of patient acceptance of the provision of pharmaceutical care, in sharp contrast to the situation in the Netherlands where pharmaceutical care has been an integral part of the health system (Van Mil 2005).

More than half of the respondents agreed or strongly agreed that they did not have enough time to provide pharmaceutical care. The present study reinforces the findings of similar studies (Dunlop & Shaw 2002, Surachat & Shu 2006, Uema *et al.* 2008) in other countries that identified time as the major barrier to its implementation. Pharmacists claim that dispensing takes too much time and they are therefore reluctant to be involved in other practices.

The current study also found that lack of financial compensation was the greatest barrier to implementing pharmaceutical care with 82% of participants agreeing or strongly agreeing. This finding is consistent with that of an earlier study (Krska & Veitch 2001, Yosi 2008) which suggested that the current remuneration structure was entirely inappropriate for encouraging the provision of pharmaceutical care and that if the contract were changed to provide payment for pharmaceutical care the focus for the majority of community pharmacists would change. Insufficient communication with a physician was considered a major barrier by respondents. It is vital to create a cooperative relationship between pharmacist and physician to develop an evidence-based care plan for patient's medicine therapy and follow-up on the patient's expected health outcome (Ranelli & Biss 2000).

Strengths and limitations

The present study has strengths and limitations. One limitation is the relatively small sample size of 101, which may lead to selection bias and imprecise estimates. To counterbalance this potential weakness, the sample was stratified by district and type of pharmacy to increase representativeness, and personal delivery and collection of questionnaires was used to improve the response rate. In addition, only selecting pharmacists within one area (Xi'an) of China is a potential limitation, and this might affect the generalisability of this study to the larger population of China. In spite of this, the current findings from this first ever study conducted in this country indicate that it is worthwhile scaling the study up to a larger size to get more generalisable findings and more reliable factor analysis results before interested stakeholders can consider applying the findings to devise a national strategy.

Conclusion

Respondents' understanding of the definition of pharmaceutical care was not entirely satisfactory. There may be

some confusion about pharmacists' understanding of the emphasis of pharmaceutical care and their role in this process. Only some aspects of pharmaceutical care were conducted in the community pharmacies investigated. Pharmacists in China appear to be deeply rooted in the traditional role of medication dispensing and counseling, and they need to expand the boundaries of their work. The perceived barriers to implementing pharmaceutical care were lack of external conditions for developing or providing pharmaceutical care, lack of time and skills, absence of information and economic incentive, and lack of full support from other health professionals. These barriers could be overcome through increasing the number of pharmacists, participating in effective continuing education programmes, and making more resources available. Finally effective communication and collaboration with other health care providers is essential if pharmacists are to provide pharmaceutical care.

Acknowledgements

The authors thank the pharmacists who took the time to participate in the study. We also appreciate Siting Zhou, PhD(Candidate), Department of Pharmaceutical Care & Health Systems, College of Pharmacy, University of Minnesota, USA, for all the time and effort she contributed in reviewing this manuscript and providing invaluable comments and suggestions.

Funding

We would like to thank the Ministry of Education of People's Republic of China for funding this research. Funding Number: LBZD046.

Conflicts of interest

None

References

- Berenguer B., La Casa C., de la Matta M.J. & Martin-Calero M.J. (2004) Pharmaceutical care: past, present and future. *Current Pharmaceutical Design* **10**, 3931–1346.
- China Licensed Pharmacist Association (2008) The National Pharmacist Survey. <http://www.clponline.cn/info/InfoList.aspx?page=1&infox=1000310002> (accessed 9 March 2008).
- Chinese Pharmaceutical Yearbook Editorial Committee (2007) *Chinese Pharmaceutical Yearbook*, 1st edn. The Publishing House of the Second Military Medical University, Shanghai.
- Cipolle R.J., Strand L.M. & Morley P.C. (2004) *Pharmaceutical Care Practice: The Clinician's Guide*. McGraw-Hill Medical Publishing, New York.
- De Castro M.S. & Correr C.J. (2007) Pharmaceutical care in community pharmacies: practice and research in Brazil. *The Annals of Pharmacotherapy* **41** (9), 1486–1493.
- Dunlop J.A. & Shaw J.P. (2002) Community pharmacists' perspectives on pharmaceutical care implementation in New Zealand. *Pharmacy World & Science* **24** (6), 224–230.
- Eickhoff C. & Schulz M. (2006) Pharmaceutical care in community pharmacies: practice and research in Germany. *The Annals of Pharmacotherapy* **40** (4), 729–735.
- Field A. (2005) *Discovering Statistics Using SPSS*, 2nd edn. Sage Publications Ltd, London.
- Hepler C.D. & Strand L.M. (1990) Opportunities and responsibilities in pharmaceutical care. *American Journal of Hospital Pharmacy* **47**, 533–543.
- Jones E.J., Mackinnon N.J. & Tsuyuki R.T. (2005) Pharmaceutical care in community pharmacies: practice and research in Canada. *The Annals of Pharmacotherapy* **39** (9), 1527–1533.
- Krska J. & Veitch G.B.A. (2001) Providing pharmaceutical care – the views of Scottish pharmacists. *Pharmacology Journal* **267**, 549–555.
- Lewis-Beck M.S. (1994) *Factor Analysis and Related Techniques*. SAGE Publications Ltd, London.
- Martin-Calero M.J., Machuca M., Murillo M.D., Cansino J., Gastelurrutia M.A. & Faus M.J. (2004) Structural process and implementation programmes of pharmaceutical care in different countries. *Current Pharmaceutical Design* **10** (31), 3969–3985.
- Ranelli P.L. & Biss J. (2000) Physicians' perceptions of communication with and responsibilities of pharmacists. *Journal of the American Pharmaceutical Association (Washington D.C.)* **40** (5), 625–630.
- Rossing C., Hansen E.H., Krass I. & Morgall J.M. (2003) Pharmaceutical care in Denmark: perceived importance of medicine-related problems and participation in post-graduate training. *Pharmacy World & Science* **25** (2), 73–78.
- Rossing C., Hansen E.H., Traulsen J.M. & Krass I. (2005) Actual and perceived provision of pharmaceutical care in Danish community pharmacies: the pharmacists' opinions. *Pharmacy World & Science* **27** (3), 175–181.
- Rovers P.R., Currie J.D., Hagel H.P., McDonough R.P. & Sobotka J.L. (1998) *A Practical Guide to Pharmaceutical Care*. The American Pharmaceutical Association, Washington, USA.
- Sharma S. (1996) *Applied Multivariate Techniques*. John Wiley, New York.
- State Food and Drug Administration. (2008) White Paper: Status Quo of Drug Supervision in China. State Food and Drug Administration, Beijing. <http://eng.sfda.gov.cn/cmsweb/webportal/W43879541/A64028182.html> (accessed 12 October 2009).
- Surachat N. & Shu C.L. (2006) Thai pharmacists' understanding, attitudes, and perceived barriers related to providing pharmaceutical care. *American Journal of Health-System Pharmacy* **63**, 2144–2150.
- Tabachnick B.G. & Fidell L.S. (2001) *Using Multivariate Statistics*, 4th edn. Allyn and Bacon, Needham Heights, MA.
- The Ministry of Health (2009) The Fourth Chinese National Health Care Survey. <http://www.moh.gov.cn/publicfiles/business/htmlfiles/mohbgt/s3582/200902/39201.htm> (accessed 10 January 2010).
- Uema S.A., Vega E.M., Armando P.D. & Fontana D. (2008) Barriers to pharmaceutical care in Argentina. *Pharmacy World & Science* **30**, 211–215.

- Van Mil J.W. (2005) Pharmaceutical care in community pharmacy: practice and research in the Netherlands. *The Annals of Pharmacotherapy* **39** (10), 1720–1725.
- Van Mil J.W. & Schulz M. (2006) A review of pharmaceutical care in community pharmacy in Europe. *Harvard Health Policy Review* **7** (1), 155–168.
- Westerlund L.T. & Björk H.T. (2006) Pharmaceutical care in community pharmacies: practice and research in Sweden. *The Annals of Pharmacotherapy* **40** (6), 1162–1169.
- Yosi W. (2008) Pharmaceutical care: the Perceptions of Community Pharmacists in Surabaya-Indonesia (A Pilot Study). Paper presented at the 8th Asian Conference on Clinical Pharmacy: “Toward Harmonisation of Education and Practice of Asian Clinical Pharmacy”, Surabaya, Indonesia.