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Research paper

Integrating traditional Chinese medicines into professional community pharmacy practice in China – Key stakeholder perspectives

Dongning Yao^{a,1}, Hao Hu^{a,1}, Joanna E. Harnett^b, Carolina Oi Lam Ung^{a,b,*}^a State Key Laboratory of Quality Research in Chinese Medicine, Institute of Chinese Medical Sciences, University of Macau, Macao SAR, China^b The University of Sydney Pharmacy School, Faculty of Medicine and Health, The University of Sydney, Australia

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ABSTRACT

Introduction: In China, Traditional Chinese Medicine (TCM) is an integral part of the health system in parallel with Western medicine (WM). However, pharmacists' duty of care at this interface has not been fully explored. This qualitative study aimed to explore key stakeholders' perceptions about the challenges and enablers to pharmacists' adopting a professional role in patient care associated with the concurrent use of herbal medicines (HMs).

Methods: Participants were recruited from the expert pool of the National Research Center for Licensed Pharmacist Development using purposive sampling and snowballing. Participants targeted included government, academics and practicing pharmacists. An interview guide was developed following a literature review and face-to-face, audiotaped interviews conducted with key stakeholders.

Results: Fourteen semi-structured interviews with both practicing pharmacists and key stakeholder representatives were conducted in China in 2017. Thematic analysis identified 6 main themes which focused on how TCM was integrated with WM in China. Participants agreed that pharmacists should at least assume a role in drug safety associated with concurrent use of TCM and WM. However, barriers were identified within the government, education, pharmacy, pharmacist and research sectors, indicating a lack of coordinated strategies to improve this area of healthcare. A lack of clarity in defining the pharmacists' role in this area and a disconnect between current regulatory standards and education/training system were the prominent themes. Participants looked towards the government to facilitate actions in the development of policies that support pharmacy practice and practice guidelines, and the review of competency standards, and registration criteria as being the most important enablers.

Conclusion: Guiding principles that outline standards for pharmacy practice regarding HMs in an integrated healthcare system are considered a priority, requiring a joint effort from the government, professional organizations and universities.

1. Introduction

In China, Traditional Chinese Medicine (TCM) is an integral part of the health system in parallel with Western medicine (WM) across all sectors [1]. In 2015, there were 3966 TCM hospitals including 446 hospitals of integrated TCM and WM, 42,528 TCM clinics including 7706 clinics of integrated medicine, and an estimated 60,000 TCM and other herbal preparations approved for use in the country [2]. Developed over thousands of years ago, TCM has a unique theoretical basis and comprehensive clinical approach to treating disease and

maintaining health and wellbeing through the use of several therapies including herbal medicines (HMs) [3].

For the purpose of this exploratory study that focuses on the professional role of pharmacists, HMs will be the central focus. HMs are commonly consumed in the form of raw materials, plant extracts (decoctions), and Chinese traditional patent medicines (CTPM) [4]. CTPM are standardized herbal formulations and often sold as over-the-counter (OTC) medicines to patients in community pharmacies for self-management [5]. At the same time, on the Essential Drugs List of China (2018) which is a key component of the China's healthcare reform, 268

* Corresponding author at: State Key Laboratory of Quality Research in Chinese Medicine, Institute of Chinese Medical Sciences, Room 2058, N22 Building, University of Macau, Taipa, Macao SAR, China.

E-mail addresses: yb57515@um.edu.mo (D. Yao), haohu@um.edu.mo (H. Hu), joanna.harnett@sydney.edu.au (J.E. Harnett), carolinaung@um.edu.mo (C.O.L. Ung).

¹ Co-first authors.

of the 685 drugs were CTPM [6]. In the clinical setting, HMs may also be given as individualized traditional prescriptions containing raw materials prescribed by the TCM practitioners [7]. Under this “one country, two (medical) systems” healthcare setting whereby TCM is deeply rooted in the culture [1], the use of HMs continues to be embraced by the public and used frequently for both disease management and health maintenance.

It is a common perception among the Chinese population that HMs are “natural” and therefore “safe” or have minimal risks [8,9]. However, adverse drug reactions (ADR) associated with the use of HMs are not uncommon in China. Official statistics shows that in 2017, around 253,000 of the 1,571,000 ADR reports involved HMs administered as intravenous preparations (54.%) and oral preparations (39.4 %); among the 17,000 serious ADR reports associated with HMs, 59,000 cases involved elderly patients [10]. Similar safety concerns about HMs misuse associated with kidney and liver injury have been repeatedly reported [11–16]. Furthermore, HMs and conventional medicines are often prescribed together for the treatment of disease or used informally as part of a self-care practice [17]. Pharmacokinetic interactions that result in the inhibition or induction of drug-metabolizing enzymes and transporters raise safety concerns and may impact treatment outcomes [18–20]. In addition to potential interactions, the component complexity of HMs and uncertainties regarding their safety and efficacy raises a need for healthcare professionals to be involved in stewarding the judicious use of HMs.

Pharmacists’ involvement in the safe and proper use of traditional and complementary medicines has been proposed to be a legitimate part of their established role of pharmaceutical care [21] and supported by international authorities [22,23]. Research in the US, Australia, Canada and Thailand, have been initiated to explore, define and review pharmacists’ duty of care (if any) with respect to T&CM products. [24–28]. Despite the high level of integration of TCM that includes HMs, and modern medicine in China, few studies have explored this area in depth. Therefore, this study aimed to identify key stakeholders’ opinions about pharmacists who practice in China adopting a professional role in relation to patients use of HM and conventional medicines.

2. Methods

2.1. Ethics approval

A grounded theory approach involving in-depth, semi-structured interviews was employed in this study to obtain detailed, nuanced and rich insights from key stakeholders [29]. The ethical approval was granted by the China Pharmaceutical University (CPU20171101) and the project was also approved by the University of Macao (MYRG2018-00012-ICMS).

2.2. Participant recruitment

In order to optimize the depth and breadth of the findings, the key stakeholder categories and the participants were selected within the cultural context and modelled on earlier studies [26,28,30]. A purposive sampling strategy was employed to recruit participants from the expert pool of the National Research Center for Licensed Pharmacist Development which was jointly established by the China Pharmaceutical University, the China Pharmaceutical Materials Association and the Licensed Pharmacist Qualification Center of the State Food and Drug Administration. This exclusive pool is composed of expert government officials, academics, and practicing pharmacists who occupy middle to high level management positions in their respective organizations and considered influential in informing the future direction of pharmacy practice. No exclusion criteria was defined a-priori, as potential participants were chosen strategically in order to obtain insight from a range of expert perspectives. These invitations were extended to

all members within the expert pool who were asked to contact the research team for information about the study and interviews. Nine out of the 30 invited members agreed to participate in the study. Time constraints was the reason provided by those who were invited but unable to participate. An additional recruitment method of snowballing was employed to identify licensed pharmacists from across all sectors who had worked for a minimum of 6 months [31].

2.3. Interview guide

The interview guide was developed by conducting a careful review of the literature related to the integration of traditional and complementary medicines into pharmacy practice in the US and Australia [28,30,32,33], and pharmacy practice in China [34–36] (see Appendix). The interview questions focused on key areas including: (1) integrative medicine; (2) community pharmacists’ responsibilities with regards to HMs; (3) factors that prevented community pharmacists from taking up such role; and (4) what it would take to improve their practice. Five pilot interviews were conducted with 3 pharmacists and 2 pharmacy students separately. Based on their feedback, interview questions were revised for clarity and prompts were added to guide the discussion in a standardized but not restrictive manner.

2.4. Interview procedures

Two investigators (1 PhD student and 1 Associate Professor) experienced in qualitative research methodology and familiar with the context of pharmacy practice in China conducted the interviews. Some participants were known to the interviewers through professional networks but not related or otherwise. The interviews were conducted face-to-face in private conference rooms at the participants’ choice, each lasting for 35–45 min. With the participants’ written consent obtained prior to commencing, each interview was audio-recorded and conducted until saturation was reached for the key emergent themes.

2.5. Data analysis

The audio recordings of the interviews were transcribed verbatim prior to analysis. In order to avoid reflexivity and to minimize bias, two other investigators fluent in both English and Chinese oversaw thematic analysis using an inductive approach. Key themes were determined using open coding, grouping and categorizing. Constant comparison within and between themes were used to ensure the analysis represented all perspectives. Analysis results were discussed and checked, and the coding was reviewed and refined within the research team.

3. Results

3.1. Participant demographics

Fourteen semi-structured interviews were conducted in Beijing China in 2017 with: 4 community pharmacists (2 junior pharmacists and 2 pharmacist-in-charge), 3 clinical pharmacists (2 chief pharmacists and 1 junior pharmacist), 1 regulatory authority representative (a deputy director), 2 pharmacy school representatives (2 associated professors), 1 professional organization representative (an executive board member), 2 chain pharmacy representatives (1 headquarter director overseeing 700 community pharmacies and 1 regional director overseeing 20 community pharmacies) and 1 key opinion leader (a consultant to the pharmacist regulatory authority and an academic). According to the thematic analysis of the qualitative data collected from the interviews, 6 main codes were identified, each of which have its own themes as shown in Table 1.

Table 1
Thematic analysis of the qualitative data collected from the interviews.

Codes	Themes
1. Purposes of HMs use by general public	1.1 Health maintenance 1.2 Self-management of minor ailments
2. Perception about integrative medicine	2.1 A term often used interchangeably with concurrent use 2.2 Different from concurrent use in which integrative medicine can bring about synergic effects.
3. Perception about the safety of HMs	3.1 Generally safe when used on its own 3.2 Minimal risk when used with conventional medicines 3.3 Certain risks when used with conventional medicines 3.4 Significant risks when used with conventional medicines for high-risks patients
4. Perception about pharmacists' role in HMs	4.1 Proactive manner 4.2 Reactive manner 4.3 Cautious manner
5. Major barriers hindering pharmacists taking up a more professional role related to HMs	5.1 Government Sector 5.2 Professional Sector 5.3 Education Sector 5.4 Pharmacy Sector 5.5 Pharmacist Sector 5.6 Research Sector
6. Actions needed to support pharmacists taking up a more professional role related to HMs	6.1 Government Sector 6.2 Professional Sector 6.3 Education Sector 6.4 Pharmacist Sector 6.5 Research Sector

3.2. Implications of integrative medicine to pharmacist profession

According to all the participants, they believed this current study was the first of its kind to explore the pharmacist's role at the interface of HMs and conventional medicines. Participants generally deemed the study focus as relevant to China as TCM is an integral part of the healthcare system and an important element of the recent health reform. In China, several terms have been used to describe the use of TCM in relation to conventional medicines. During each interview, participants were asked to express their views about how TCM is integrated with WM in China. Despite a range of opinions being discussed, the majority of responses reflected a similar view about how 'integration'

Table 2
Major challenges and important enablers.

Barriers	Stakeholder sectors	Enablers
<ul style="list-style-type: none"> ● Lack of legal definition of integrative medicine ● Mismatch of regulation with patients' needs ● Lack of a reasonable remuneration system 	Government	<ul style="list-style-type: none"> ● Clear definition of integrative medicine ● Clear definition of pharmacist's professional role in patient care ● A reasonable remuneration system for pharmacist' professional services
<ul style="list-style-type: none"> ● Lack of pharmacist-specific practice guidelines 	Professional	<ul style="list-style-type: none"> ● An accreditation system for specialized pharmacists ● Revision of product insert requirements for pharmaceutical products ● Development of guiding documents to standardize pharmacists' practice
<ul style="list-style-type: none"> ● Lack of training/education standards and internship program ● Lack of education about integrative medicine ● Lack of related CPE ● Lack of a professional image ● Only one type of pharmacists on duty 	Education	<ul style="list-style-type: none"> ● Teaching about the concurrent use in the undergraduate course and CPE
<ul style="list-style-type: none"> ● Lack of the competence to provide professional service ● Lack of knowledge about Chinese medicines or conventional medicines ● Lack of professional image ● Lack of motivation or interests in direct patient care ● Lack of information source ● Lack of practice guideline ● Lack of research about the concurrent use of Chinese medicines and conventional medicines 	Pharmacy Pharmacist	<ul style="list-style-type: none"> ● Revision of the internship requirements ● Being more motivated to learn continuously
	Research	<ul style="list-style-type: none"> ● More research to support the development of practice guideline

was practiced in pharmacy”.

“Integrative medicine is not simply putting or using the therapies or products of Chinese Medicine and Conventional Medicine together... There needs to be a process of rigorous scientific approach to find out which conditions will benefit the most from Chinese Medicine, Conventional Medicine or both, and how.” (Regulatory authority representative)

However, participants were aware of the current challenges in developing the evidence base about TCM and more so about the integration of HMs and conventional medicines.

“In clinical practice, we often see great benefits in clinical outcome with the use of Chinese medicines. So many cases have confirmed that like it was demonstrated in the treatment of SARS (severe acute respiratory syndrome) ... However, we lack the evidence-based medicine to explain it.” (Clinical pharmacist 2)

Nevertheless, they all agreed that pharmacists have a role to play in supporting the safe and appropriate use of HMs. As some suggested, such a role would largely be confined to safety assurance or risk minimization and would not necessarily optimize the efficacy of treatment outcomes as the evidence base remains limited on this topic.

“In the end, pharmacists are the experts of medicines. For sure they are much more knowledgeable about medicine than the general public. So, whenever pharmacists can confirm the proper use of medicines, it will definitely help to promote the rationale use of medicines.” (Chain pharmacy representative 1)

3.3. Major challenges and important enablers

While the participants did not discuss in detail the exact role and responsibilities that pharmacists should adopt with regards to HMs, they were keen on discussing the current challenges and possible enablers. As shown in Table 2, the challenges and enablers discussed were categorized according to one of the 6 corresponding stakeholder sectors: policy, professional, education, pharmacy, pharmacist and research.

3.4. Challenges

Within the government sector, the participants proposed there are four

main areas that have a major influence on community pharmacist's adoption of a role in relation to HMs:

(1) Lack of legal definition of integrative medicine

"The discussion about integrative medicine has stagnated in medical practice for many years now, not to mention pharmaceutical care. Theoretically, the definition of integrative medicine at different settings should be clearly defined in the national policy. But we are just lacking such clarification at the moment." (Regulatory authority representative)

(2) Mismatch of regulation with patients' needs

"There are two types of licensed pharmacists: general pharmacists and pharmacists of Chinese medicines. Is there any cross over in their practice or are they allowed to cross over? In terms of professional scope of practice, of course they are separated. However, it is hardly feasible in practice and the general public does not have the clear differentiation about medicines in their perception." (Regulatory authority representative).

(3) Lack of a reasonable remuneration system

"The government will not give me any remuneration even if I provide the patients with any advice or professional services. It is not something that can be evaluated easily at least not from an economic point of view." (Chain pharmacy representative 2)

Within the professional sector, some participants emphasized on the importance of practice guidelines which are currently lacking in many areas of pharmacist practice.

"Many of the practice guidelines are designed specifically for doctors and nurses but not pharmacists. The overall development of pharmacist profession suffers because pharmacists are seldom mentioned in the practical approach clinically." (Key opinion leader)

Within the education sector, there were mainly complaints about a lack of standardization in education and training and an internship program. Topics about the interface between HMs and conventional medicines were not taught and continuing professional development (CPD) on this topic was also very limited.

(1) Lack of training/education standards and internship program

"Licensed pharmacists may have very different training background. They might only have a diploma degree or other higher degrees. In practice, they might not even know what the rational use of drugs or drug safety are. They might have the license but not the professional competency. Without proper internship program, what they know will only be theories." (Chain pharmacy representative 1)

(2) Lack of a pedagogical approach to integrating TCM education

"How are we going to teach the theories of TCM? Is it just a brief introduction of the TCM theories? To be able to do the job, you need to learn about TCM thoroughly. A light touch on the subject won't serve the purpose. But it is very hard to develop such teaching system." (Regulatory authority representative)

(3) Limited coverage in continuing professional development

"The level of basic knowledge about pharmacy among pharmacists maybe uncertain especially when many of them learned about pharmaceutical care through distant learning or online." (Community pharmacist 1)

Within the pharmacy sector, most participants believed that the community pharmacy was heavily retail orientated rather than on pharmaceutical care related to HMs. Moreover, the pharmacy is usually attended by only one type of pharmacist, and minimal professional

services are provided.

(1) Lack of professionalism

"In most of the community pharmacists, both conventional medicines and Chinese medicines are available concurrently. The way pharmacist practice at the moment, however, is still very much retail orientated." (Professional organization representative)

(2) Only one type of pharmacists on duty

"There is usually one type of pharmacist on duty whether it be at clinical setting or community pharmacy. If you are a pharmacist of Chinese medicines, of course there is only so much you can do about conventional medicines. If you are a general pharmacist, of course you will not know much about Chinese medicines neither." (Community pharmacist 1)

Within the pharmacist sector, it was a common perception that community pharmacists lacked the competence, the interests and the support to provide professional service.

(1) Lack of professional competency

"Most of the licensed pharmacists really don't know much about medicines, not to mention the pharmaceutical care they are expected to provide. They are probably not involved in any professional duties." (Clinical pharmacist 2)

(2) Lack of expertise in both HMs and conventional medicines

"It is highly difficult because we have two types of pharmacists: general pharmacists and pharmacists of Chinese medicines. General pharmacists do not know much about Chinese medicines, and pharmacists of Chinese medicines do not know much about conventional medicines. So, when Chinese medicines and conventional medicines are used together, how would any of these pharmacists manage?" (Community pharmacist 1)

(3) Professional verse retail role

"It doesn't matter how you see it, even in the perspective of quality control, all they (pharmacists) do is sale. From what I can tell, more than 95 % of pharmacists are retail oriented." (Key opinion leader)

(4) Lack of motivation or interests in direct patient care

"For pharmacist, if you work at front of shop and your salary counts on the commission you receive, there is always a detachment from your professional standards." (Clinical pharmacist 2)

(5) Lack of access to reliable information resources

"I have the same concerns during my practice as well. When you try to find out information about possible interactions of the conventional medicines from the product insert, there is only very limited information." (Regulatory authority representative)

Within the research sector, participants were concerned about the limited evidence base to inform the concurrent use of HMs and conventional medicines.

"According to modern science, any technology must be validated through a process of clinical research. Even though we have been using TCM so many years, and TCM development has been going on for so many years, clinical experiments and research about the concurrent use of Chinese medicines and conventional medicines are really very limited. (Regulatory authority representative)

3.5. Enablers to support pharmacists' practice

Participants' opinions about how to support pharmacists assuming a more professional role related to HMs weighted heavily within the

government sector but did not engage the pharmacy sector.

Within the government sector, 5 actions have been recommended:

(1) Clear definition of integrative medicine for pharmacist

“In fact, from a scientific point of view, if the country develops well enough and the existing theoretical system is difficult to change, in order to provide properly differentiated professional services, the policy should recognize the need of developing a new system based on the enormous complexity of integrating the two medical systems together. It is really not as simple as placing them together.” (Regulatory authority representative)

(2) Clear definition of pharmacist’s professional role in patient care

“First and foremost, we need policy and regulatory support to mandate the responsibility of pharmacists in ensuring the rational use of medicines through evaluation of prescriptions or supervision over the sales of medicines. Without the legal requirements, it is very hard for pharmacists to carry out their professional duties.” (Chain pharmacy representative 1)

(3) A reasonable remuneration system for pharmacist professional services

“It is important to realize the value of the professional service provided by the pharmacists with a reasonable reimbursement system in order to provide incentive and motivation. For instance, with evaluation of prescription, how would you show the recognition of the work and effort pharmacists have put in? It is not a matter of how much they get paid. It is about if they get paid at all. Anything free of charge is demeaning and not sustainable.” (Chain pharmacy representative 1)

(4) An accreditation system for specialized pharmacists

“A systematic approach is needed here. To be more specific, there needs to be separate accreditation system for Western medicine pharmacist, Chinese medicine pharmacists and integrative medicine pharmacists to address the needs in the practical settings.” (Chain pharmacy representative 1)

(5) Revision of product insert requirements for pharmaceutical products

“There is this issue about product insert which is interesting when we talk about TCM modernization. At the very least, precautions when using a particular TCM should be specified in the product insert. This is important to raise the safety awareness of the pharmacists as well as the consumers. The precaution information is needed to send out the important message about safety.” (Clinical pharmacist 1)

Within the professional sector, the development of guiding documents to standardize pharmacists’ practice was considered a priority action by some participants.

“I think the development of practice guidance should be considered first. There must be some norms that specify, when it comes to the use of Chinese medicines and conventional medicines, what pharmacists should do, or when pharmacists are in the position to make recommendation, how they can distinguish symptoms in Chinese Medicine terms and decide on the products... I think there should be some standards, or consensus, to solve this problem.” (Key Opinion Leader)

Within the education sector, participants proposed strategies required to resolve 3 of the barriers:

(1) Teaching about the concurrent use of HMs and conventional medicines in the undergraduate course and CPE

“I think teaching about modernization of TCMs or integrative medicine should be integrated into the syllabus of the pharmacy undergraduate course. In the pharmacy training course, students are taught about pharmacotherapy and this should cover both conventional medicines and TCMs.” (Clinical pharmacist 2)

(2) Revision of the internship requirements

For many who have passed the licensing tests, they might not have any practical experiences. The education system currently in place is the major cause which I think needs a major revision. There must be an internship criterion before they can sit for the license exam” (Chain pharmacy representative 1)

Within the pharmacist sector, key stakeholders urged them to be more proactive in developing their competence and provide professional services.

“Pharmacists need to take the initiative to develop their own profession. Very often, pharmacists nowadays do not know how to transform themselves. Maybe there needs more promotion about the shift of pharmacist profession towards a health care professional. But pharmacists need to demonstrate their professional ability to gain patients’ trust.” (Clinical pharmacist 3)

Within the research sector, more research is needed to support the development of practice guideline for pharmacist.

“The way pharmacists’ practice should be standardized and supported with evidence especially in relation to when and how TCMs and conventional medicines should be used together. Pharmacists need to be instructed about the symptom differentiation which is also very important.” (Key opinion leader)

4. Discussion

The results of the analysis of the 14 in-depth key stakeholder interviews conducted in this study identified a range of opinions about how pharmacists approach their duty of care related to HMs and conventional medicines use in China. The results are consistent with the views of stakeholders in the US and Australia that suggest pharmacists be involved in T&CM pharmaceutical care, and that such a role remains poorly defined. [28,32] This study reinforced the findings of earlier work in the US and Australia that also suggested pharmacists should at least assume a role in assuring the safe use of HMs [28,32]. Our findings suggest that barriers exist within a range of pharmacy sectors including government, professional associations, education, pharmacy business, pharmacist and research. This information can be used to inform strategies that support pharmacists in extending their role to better address their patients’ needs related to HMs use [26,32,33].

The term “integrative medicine” was a recurrent term used by participants during the interviews in this study. However, there was some ambiguity about the definition of ‘integrative medicine’ within the context of pharmacy practice. In China, the term “integrative medicine” or “integration of TCM and WM” has been in use since the 1950’s and refers to the integration of “*knowledge of Chinese medicine and Materia medica with the knowledge of western medicine and pharmacology, to create our unique new medicine and new pharmacology*”. [37–39] With the governments support, an integration of TCM into education, licensing, clinical practice, research and policy of medical practice has been observed [37,39–41]. However, such developments in integration do not appear to have extended to pharmacy professional practice. To date, there is no accepted definition of integrative medicine in pharmacy in China. To this end, participants in this study believed that establishing a stronger evidence-base for HMs efficacy and safety was a key to adopting two knowledge systems within one alternative medical approach [42].

The view that the concurrent use of HMs and conventional

medicines is not supported by evidence to suggest a benefit, or that such combinations are safe and effective has previously been raised. [42–45] While such benefits may exist, the complexities of multi-constituent HMs poses significant challenges for researchers in establishing the strength of evidence that is required to make confident recommendations [46–48]. This being said, many preclinical studies do report potential drug-herb interactions including the inhibitory effects of specific HMs on a range of cytochrome P450 enzymes involved in drug metabolism [49–53]. Multiple medicines use also raises another important role for pharmacists in minimizing the risks of drug related problems associated with polypharmacy [54,55], predisposing conditions such as chronic or other serious diseases [56–58], and delay of necessary treatment [59–61]. The role of pharmacists as custodians of safe medicines use, specifically as it relates to the concurrent use of T&CM and conventional medicines, is supported by others. [24,62,63].

In order to provide a solid foundation for pharmacists in realizing this extended role, the ethical and professional responsibilities, as well as standard of practice related to traditional and complementary medicines should be considered a priority. This finding is consistent with what Popattia et al. and Ung et al. have previously proposed. [26,30,64] Professional organizations in some countries have already released statements to raise pharmacists' awareness about the extension of their professional roles. For instance, the position statement by the American Society of Health-System Pharmacists urges pharmacists increasing efforts to prevent interactions between dietary supplements and prescription drugs [65]. Similarly, the position statement by the Pharmaceutical Society of Australia (PSA) confirmed pharmacists' responsibility in supporting consumers making informed decisions about the use complementary medicines [66]. In China, the importance of developing documents to provide a foundation for decision-making in integrative medicine is also recognized, but limited to medical practice [67,68].

For pharmacists in China, to address the gaps in practice guidelines, the development of professional practice standards (PPS) should be made a priority with a view to fostering pharmacists' critical role in drug safety. PPS articulate the values of the pharmacy profession and expected standards of professional behavior of pharmacists towards individuals, the community and society. [69] On the one hand, PPS can help guide the development of professional practice guidelines. Such guidelines can be used to inform competency standards which may then be used to inform education and training design. Once PPS are established, the pharmacist's extended role may be formalized, and they will be bound to seeking continuous learning opportunities and improving practice according to the informed standards. Although it was not discussed explicitly, the collective actions suggested by the key stakeholders confirmed the need for a joint effort to support pharmacists' practice in ensuring the safe use of HMs [28,67], and the process should be guided by a systematic methodology to yield high-quality evidenced instructive documents [32,68].

The discussion about pharmacists' role in the area of HMs and more broadly, raises concerns over the competence of the overall workforce. Within the community sector, there are two types of regulated pharmacists: *Licensed Pharmacist* and *Licensed Pharmacist of Chinese Medicine*. Although they are subject to prescribed obligations and responsibilities in the regulatory system and assessment process [32], they were often found ill-equipped to provide professional services [70–72]. The implications of this argument has been discussed in detail in previous studies [33–36] What is relevant to the focus of this study was whether these pharmacists are positioned and supported to address the patients' needs in a coordinated manner. Ideally, a holistic approach that engages both types of pharmacists skillsets in patient care is encouraged [73,74]. However, the current regulation clearly defines their scope of practice in either HMs or conventional medicine depending on their specialty. More critically, their responsibilities, as currently defined in the SFDA regulations, do not include the duty to provide and maintain proper care for patients [75]. This is despite the fact that the healthcare

reform plan highlighted the responsibilities of community pharmacies and pharmacists in providing primary healthcare [76–78].

With pharmacists playing an increasingly important role in patient care, it is important for the legal and professional obligations of licensed pharmacists stipulated by law to fully correspond to the needs of the general public and the consideration should include the use of HMs, conventional medicines and their concurrent use [33,79]. Appropriate training and education should also be in place. Training in both TCM and WM would allow pharmacists to play a role in both HMs and conventional medicines, promote a more collaborative relationship with other health-care disciplines and assume greater responsibility in prospering a well-defined model of integrative medicine [80,81] This further highlights the need for pharmacists to engage in continuous learning to develop their competence and professional role in the pharmacy. As stated in the Good Pharmacy Practice, "pharmacists should take steps to update their knowledge and skills about complementary and alternative therapies" as part of their role in maintaining and improving professional performance [23].

5. Limitations

This study has several limitations affecting the generalizability of the findings across the country. TCM is not the only traditional medicine practiced in China, and other ethnic minority medicine may also be used even more frequently than TCM in some parts of China. Even though saturation was achieved, the opinions and comments provided by the limited number of participants in this study might only refer to areas where pharmacists' role is more developed. In addition, the inclusion of up to 2 representatives from the key stakeholder categories may not be able to provide the full capacity to reflect on the complete view about the interview questions to the groups they are representing, warranting wider sampling in future studies. Furthermore, due to constraints of this study, the perspectives of patients and consumers were not included. Nevertheless, the qualitative approach met the objectives of collecting rich, in-depth information about the dilemma pharmacists in China are currently facing with regards to HMs. The findings can serve to inform policy makers, professional organizations and research institutes about the relevance of HMs when deciding pharmacist's legal role, ethical and professional responsibilities, and practice standards in relation to TCM. Subsequent studies are planned that will focus on the general public including patients and consumers of HM to gain an understanding of the expectations for pharmacists in the area of HMs.

6. Conclusion

HMs feature prominently within the daily practice of community and hospital pharmacy in China. Despite their prominence, key stakeholders report that there are gaps in pharmacists knowledge and therefore professional capacity to provide comprehensive pharmaceutical care that facilitates the safe use of both HMs and conventional medicines. Guiding principles that outline standards for such use in an integrated healthcare system are required. Such standards would serve as a baseline for professional expectations within existing practice, and serve as a framework for teaching institutions to model pharmacy education for undergraduate and continuing professional development programs. Given the pharmacy profession is largely policy-driven in China, the governing authorities are encouraged to take this opportunity to initiate future work in developing practice standards and foster collaborations between key stakeholders including research institutes, universities, pharmaceutical organizations and other healthcare stakeholders to build capacity in this area that ultimately addresses the needs of the public who use HMs.

Authors contribution

JEH and COLU conceptualized the study design. DY and HH conducted the interviews and performed preliminary data analysis. COLU verified the qualitative analysis. DY and HH drafted the manuscript. JEH and COLU critically reviewed and edited the manuscript. DY and HH share first-authorship.

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Declaration of Competing Interest

None.

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Appendix A

Interview guide

- 1 How are traditional Chinese medicines used by consumers and patients?
- 2 In your opinion what types of traditional Chinese medicines are relevant to Pharmacy Practice?
- 3 What is your perception about “integrative medicine” in pharmacy practice?
- 4 Do you have any concerns regarding TM/CM use and how is pharmacist profession addressing these concerns?
- 5 What is your understanding of the community pharmacists’ duty of care regarding self-medication with traditional Chinese medicines?
- 6 What is your understanding of the general approach community pharmacists currently take with regards to consumers’ use of traditional Chinese medicines?
- 7 Can you describe the consumers’ expectation of community pharmacists’ in relation to the provision of traditional Chinese medicines?
- 8 What factors need to be considered to assist community pharmacists’ meet their professional and legal obligations in the provision of traditional Chinese medicines?
- 9 In your opinion, what are the main barriers that hinder community pharmacists from providing professional support for consumers using traditional Chinese medicines?
- 10 In your opinion, what actions are needed to support pharmacist practice that meets the expectations with regards to the use of traditional Chinese medicines?

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