

## The Evolving Role of the Community Pharmacist in Chronic Disease Management - A Literature Review

Pradeep P George,<sup>1</sup>BSMS, MSc(Epidemiology), Joseph AD Molina,<sup>1</sup>MD, MSc, Jason Cheah,<sup>2</sup>MBBS, MMed(Public Health), MSc(Wales), Soo Chung Chan,<sup>3</sup>BPharm(Hons), Boon Peng Lim,<sup>4</sup>BPharm(Hons),

### Abstract

**Introduction:** We appraised the roles and responsibilities assigned to community pharmacists internationally and in Singapore. **Materials and Methods:** A systematic search of international peer-reviewed literature was undertaken using Medline. Grey literature was identified through generic search engines. The search period was from 1 January 1991 to 30 July 2009. The search criteria were English language manuscripts and search terms "community pharmacist", "community pharmacy", "disease management" and "roles" as a major heading. Boolean operators were used to combine the search terms. Identified abstracts were independently reviewed and the findings were presented as a narrative summary. **Results:** Overall, we reviewed 115 articles on an abstract level and retrieved 45 of those as full text articles for background information review and inclusion into the evidence report. Of the articles included in the review, 32% were from United Kingdom (UK). Literature highlights the multi-faceted role of the community pharmacist in disease management. Community pharmacists were involved in the management of asthma, arthritis, cardiovascular diseases, diabetes, depression, hypertension, osteoporosis and palliative care either alone or in the disease management team. Evidence of effectiveness for community pharmacy/ community pharmacist interventions exists for lipid, diabetes, and hypertension management and for preventive services such as weight management, osteoporosis prevention and flu immunisation services. Majority of the community pharmacists in Singapore play the traditional role of dispensing. Attempts by the private community pharmacies to provide some professional services were not successful due to lack of funding. Factors found to impede the growth of community pharmacists are insufficient integration of community pharmacist input into healthcare pathways, poor relationship among pharmacists and physicians, lack of access to patient information, time constraints and inadequate compensation. **Conclusion:** Evidence from observational studies points out the wide range of roles played by the community pharmacist and provides insights into their integration into chronic disease management programmes and health promotion.

Ann Acad Med Singapore 2010;39:861-7

**Key words:** Community pharmacy, Interventions, Services, Roles

### Introduction

Pharmacy has matured as a clinical profession and is presently well positioned to transform itself from a product and task oriented (dispensing) to a patient oriented profession (provision of care, advice and counselling).<sup>1</sup> Every day, millions of people across the world visit community pharmacies for their healthcare needs for minor ailments. Due to easy accessibility and perceived affordability, pharmacists are the first point of contact in the healthcare system in many developed and developing countries.<sup>2</sup> Recently, several developed countries such as

Australia, United States (US) and United Kingdom (UK) have recognised the new roles of the community pharmacists in the multidisciplinary provision of healthcare. In these countries, community pharmacists provide a wide range of healthcare interventions.<sup>2-6</sup> In contrast, community pharmacists in Singapore and neighboring countries are generally more limited to their traditional role of drug dispensing and limited medication advice.<sup>7</sup> The purpose of this review is to summarise the roles and responsibilities assigned to community pharmacists internationally and in Singapore. This information would help health planners

<sup>1</sup> Health Services & Outcomes Research (HSOR), National Healthcare Group, Singapore

<sup>2</sup> Agency for Integrated Care, Singapore

<sup>3</sup> National Healthcare Group Pharmacy, Singapore

<sup>4</sup> Pharmacy & Therapeutics Office, National Healthcare Group, Singapore

Address for correspondence: Dr Pradeep Paul, National Healthcare Group, 6 Commonwealth Lane, #04-01/02 GMTI Building, Singapore 149547.

E-mail: Pradeep\_Paul\_G\_Gunapal@nhg.com.sg

appreciate the evolving role of the community pharmacist, and to efficiently utilise and integrate them in the existing and future healthcare models.

## Materials and Methods

A systematic search of international peer-reviewed literature in Medline was carried out on chronic disease management roles of the community pharmacist. Grey literature such as conference proceedings, abstracts, presentations, technical reports were identified on these topics using generic search engines (e.g. Google, Yahoo, etc.) The search terms used were "community pharmacists", "community pharmacies", "public health" "disease prevention", "disease management", "interventions" and "roles". Boolean operators were used to combine the search terms and the search was limited to English language manuscripts because it was the language of proficiency of our research team. Reference lists of retrieved studies were reviewed for relevant articles. Studies were assessed for relevance based on the abstracts. Relevance was judged by health improvement, and the role of community pharmacist. Manuscripts in which the role of the community pharmacist was not a major heading were excluded. The findings are presented as a narrative summary. The search covered the period from 1 January 1991 to 30 July 2009. The limits were to ensure manageable yield and to filter out old publications.

## Results

Overall, we reviewed 115 articles on an abstract level, and retrieved 45 of those as full text articles, for information review and inclusion into the evidence report (Fig. 1). Majority of the selected articles (32%) were from UK.

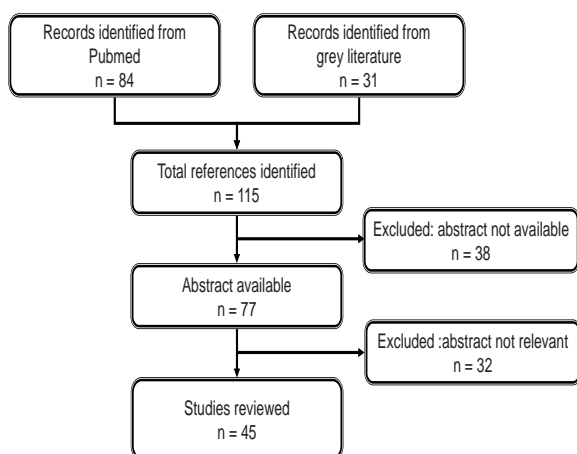


Fig. 1. Flow chart of literature search.

## Community Pharmacy, Community Pharmacist – International Scenario

Around the world, community pharmacists serve as drug experts providing pharmacological advice, and limited patient care for minor conditions in their community pharmacies. In many countries, community pharmacies are places where individuals may obtain health advice and assistance for managing their disease status with medication.<sup>6</sup>

In the UK, National Health Service (NHS) pharmaceutical services are delivered under contract by privately owned community pharmacies.<sup>8</sup> Community pharmacies in UK have a crucial role in primary care and public health; there are also several examples of community pharmacy involvement in chronic disease management. In the North-East Primary Care Trust Hospital, patient hospital discharge information concerning high-risk patients are faxed to community pharmacists. The pharmacist visits the person at home for medication review, liaises with the GP practice, produces a care plan and continues to monitor progress/control.<sup>9</sup> In another example, a group of community pharmacists have been providing anticoagulant clinic services in County Durham for over 10 years. Using standard operating procedures, they run clinics in a group practice and a community pharmacy.<sup>8</sup>

In Canada, community pharmacists work in a variety of locations including neighborhood pharmacies, clinics, supermarkets, chain pharmacies and department stores. Apart from providing regular care, they offer additional professional services such as post-surgical and home care. They also provide athletic supplies and self-diagnostic machines and kits. Community pharmacists in Canada may also practice in primary healthcare teams, long-term personal care homes, or specialise in areas such as geriatric pharmacy.<sup>10</sup>

Community pharmacists in Brazil operate mainly in commercial establishments. These community pharmacies provide a wide range of services such as drug dispensing, blood pressure measurement, capillary glucose testing, cholesterol/triglyceride testing, nebulisation, administration of injectables and compounding, and nurse-led immunisation service. The Federal Council of Pharmacists, Brazil's model of community pharmacy, encourages pharmacies to become healthcare centres and to carry out health education campaigns, immunisations, primary care and disease management activities. In March 2006, the Brazilian Minister of Health included pharmacy services in the primary healthcare bill and allocated funds for pharmaceutical care. This initiative is expected to rationalise the use of medicines and improve patient care through shared decision-making approach to help patients to get the most from their medicines.<sup>11</sup>

German community pharmacies are moving from the image of mainly supplying drugs towards the provision of cognitive pharmaceutical services. Community pharmacists contribute to health promotion, the promotion of rational prescribing and appropriate use of medicine. Along with this, they provide drug information, pharmaceutical care and preventive care services.<sup>12</sup> In 2003, a nationwide contract was established among representatives of community pharmacy owners and Germany’s largest health insurance fund. In this so-called family pharmacy contract, remuneration of pharmacists for the provision of pharmaceutical care services was successfully negotiated. There are several ongoing pharmaceutical care programmes for asthma, diabetes, hypertension and the elderly.<sup>13</sup>

Finland had 799 community pharmacies as of 2005. Medication counselling has been mandated by law since 1983 and only pharmacists are permitted to provide therapeutic advice in pharmacies. Since the late 1990s, Finnish pharmacies have actively participated in national public health programmes, initially in the areas of asthma and diabetes, and more recently in the treatment and prevention of heart disease.<sup>14</sup>

In Australia, some 5000 community pharmacies across the country are part suppliers of Government-funded pharmaceuticals and part retailers. The community pharmacy owners are represented by the Pharmacy Guild, which negotiates the reimbursement contract with the Federal Government. The community pharmacist works closely with general practitioner and other members of the healthcare team to address medication needs of the community. The role of community pharmacists extends beyond dispensing to medication review and disease management. They provide

patient care based on their specialised knowledge and also provide medication management services in residential aged care and domiciliary settings. Nursing homes contract the services of community pharmacies to supply medication in calendar packs to streamline and improve the medication use process in those facilities. Community pharmacy services for disease management in asthma and diabetes are considered for reimbursement.<sup>15</sup>

In Portugal, as of 1999, there were 2549 pharmacies with a coverage ratio of 4692 inhabitants per pharmacy. Of the 7825 pharmacists, more than half (52%) were community pharmacists. The community pharmacist actively contributes to the adoption of healthy habits and the prevention of illness, making the pharmacy a place of healthcare that plays an increasingly active role in the rational use of medicines and in promoting the well-being of the population. Indeed, the pharmacist plays an active role in promoting the rational use of medicines, pharmaco-surveillance, health education, disease detection, and in providing medication related information to both doctors and patients. Besides their regular dispensing role, community pharmacists are involved in disease management programmes for diabetes, hypertension and asthma.<sup>16</sup>

The Global Pharmacy work force report published in 2006 states that 70% of the pharmacists in Australia work in the community pharmacy sector while in Singapore and Taiwan, less than 20% of the workforce is in the community sector (fig. 2). These countries have higher percentages of pharmacists working in the global sales and marketing sector, 11% (Singapore) and 9% (Taiwan) compared to other countries in the Asia Pacific region<sup>17</sup> (Fig. 3).

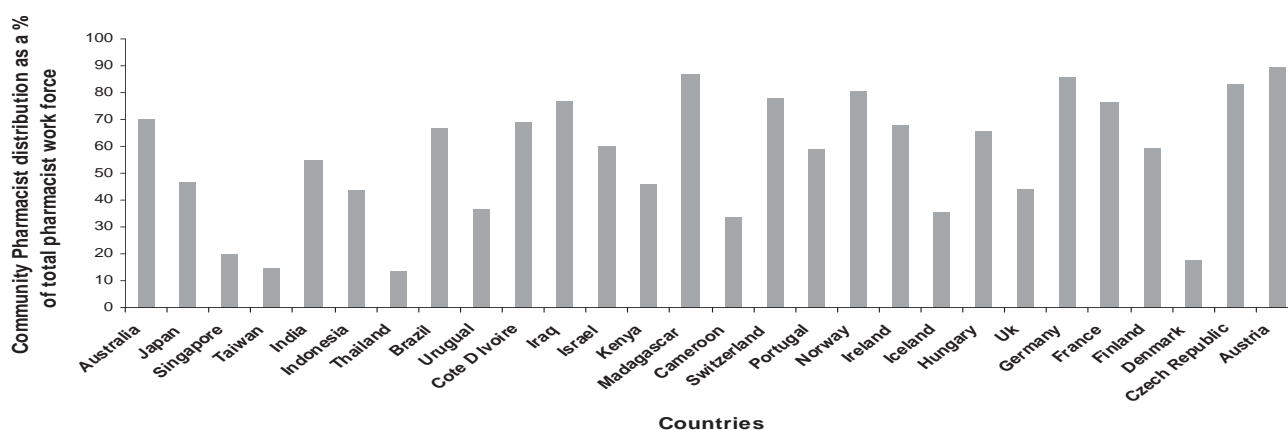


Fig. 2. Percentage of community pharmacists of the total pharmacist work force.

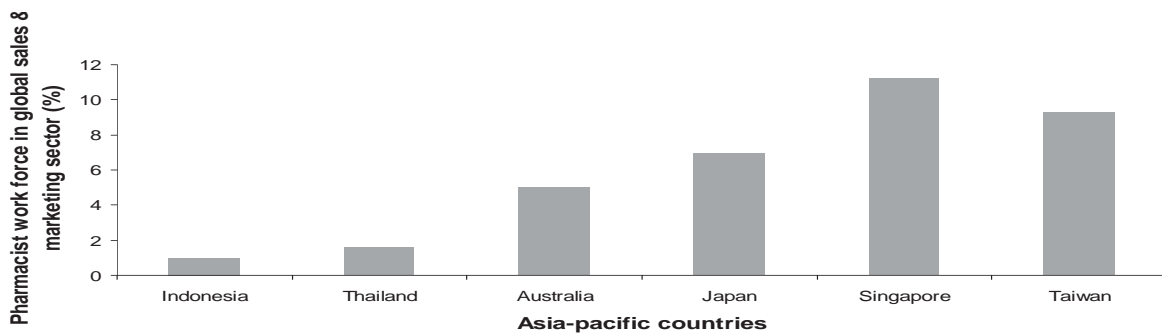


Fig. 3. Pharmacists in sales and marketing as a percentage of total work force in the Asia Pacific region.

### Community Pharmacy, Community Pharmacist – Singapore

Community pharmacies and pharmacists in Singapore are well positioned to serve as front-line primary healthcare providers. There are currently more than 1500 registered pharmacists in Singapore, with the largest proportion (around 225) working in retail or community pharmacies. The pharmacist to the population ratio is 1:3090. In Singapore, pharmacy chain stores owned by private organizations dominate the community pharmacy scene, with only a few independent community pharmacy stores distributed across the island. Community pharmacist's duties range from dispensing prescribed medications to advising consumers on over-the-counter drugs and general health matters. The attrition rate of community pharmacists is high, and limited career scope is one of the reasons why community pharmacists prefer other avenues such as work in the pharmaceutical industry or healthcare administration. The drug regulatory framework in Singapore provides for a 'Pharmacy' category of medicines, which only pharmacists can supply without a prescription. Pharmacists in Singapore do not receive any additional fee for consultation.<sup>17</sup>

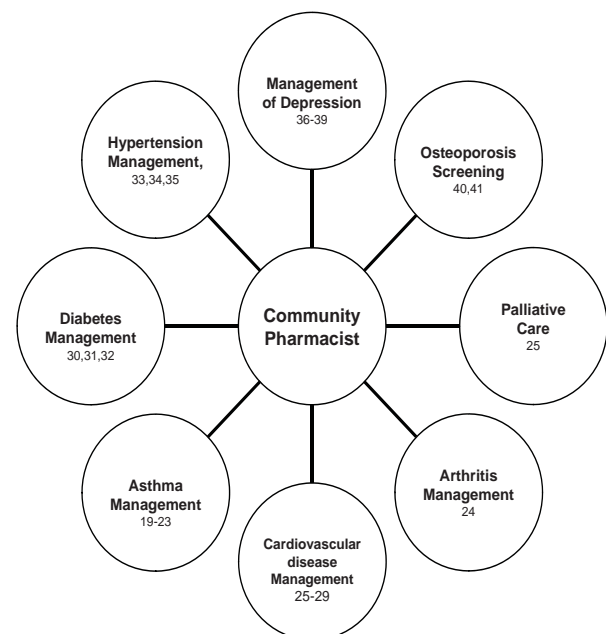
### Community Pharmacist's Role in Disease Management

Community pharmacists are in a strong position to contribute towards improved patient care by providing certain chronic disease management services. Several major trials worldwide have documented the community pharmacists' role in the management of certain chronic conditions.<sup>18</sup> Figure 4 shows the documented roles of the community pharmacist in chronic disease management.

#### Asthma Management

Asthma care programmes involving community pharmacists have been shown to improve the quality of life and clinical outcomes.<sup>19-23</sup> Reported benefits include reduced symptoms of asthma, improved perception of asthma control, increased peak expiratory flow, reduced

absences from work or school, reduced short-acting  $\beta$ -2 agonist use, reduced emergency room and in-patient admission and associated costs, and improved asthma knowledge.<sup>20,22</sup> Pharmacists can effectively train patients in correct inhaler technique.<sup>23</sup>



The numbers in figure are the corresponding references.

Fig. 4. Disease management roles of community pharmacists.

#### Arthritis Management

Physicians have recognised the role of the pharmacist in the clinical aspects of arthritis management. The community pharmacist becomes a drug consultant for patients who have been prescribed therapy by the physician. He counsels the patient about the disease process and on the role of drugs, and informs the patient of drug interactions and adverse reactions. The community pharmacist at times advises doctors about dosage forms and dosage regimes.<sup>24</sup>



### *Palliative Care and Pain Management*

Family physicians are often the first port of call for people with pain, but community pharmacists (and nurses) are important sources of advice for many people. Community pharmacists can be consulted without an appointment in many convenient locations. They can give timely advice to patients at the onset of low back pain and can reinforce advice given by other healthcare professionals. They can provide over-the-counter (OTC) analgesics and non-steroidal anti-inflammatory drugs (NSAIDs), when safe to do so, and refer those with "red flags" to seek medical care.<sup>25</sup>

### *Cardiovascular Disease Management*

Community pharmacists are well placed to help patients who have cardiovascular disease or who are at risk of this.<sup>25</sup> Community pharmacy-based interventions have resulted in reduction in risk behaviours and risk factors for coronary heart disease (CHD). Studies have demonstrated their role in improving surrogate outcomes for patients with cardiovascular disease by managing hyperlipidemia, hypertension, and secondary prevention medications. Evidence from studies support the wider provision of community pharmacy interventions for smoking cessation and lipid management.<sup>27-29</sup>

### *Diabetes Management*

Community pharmacists are in a strategic position to provide extended diabetes care for several reasons. There is considerable evidence of effectiveness of diabetes management services provided by community pharmacies.<sup>30</sup> A patient with diabetes may see his/her pharmacist 5 times more often than his/her primary care physician.<sup>31</sup> Pharmacists have significant training in the pharmacotherapy of diabetes and cardiovascular disease and can make valuable drug therapy recommendations to physicians. Pharmacists are also skilled at identifying adherence problems and addressing adverse drug effects, and many pharmacists are trained to educate and motivate patients on diet, exercise, and diabetes self-care activities.<sup>32</sup>

One meta-analysis showed that pharmacist interventions can significantly decrease HbA1c levels across a variety of settings, including clinics and community pharmacies.<sup>30</sup> Evidence from Australian studies suggests community pharmacy-based diabetes management services lead to a significantly greater reduction in HbA1c compared with controls.<sup>15</sup> A randomised controlled trial done by McLean et al<sup>33</sup> showed that pharmacy-based targeting of people with risk factors for diabetes, incorporating 'point of care' blood glucose testing prior to referral was more effective and cost-effective than targeting and referral alone.<sup>33</sup> Community pharmacy-based diabetes monitoring and information-

giving shows promise in improving diabetes control.

### *Hypertension Management*

A systematic review of 13 trials found evidence of effectiveness of pharmacist input in significantly reducing systolic blood pressure.<sup>34</sup> A controlled study showed that blood pressure control improved in the intervention arm of a community pharmacy-based 'health promotion programme'.<sup>35</sup> In a study on 14 community pharmacies in Edmonton, Alberta, Canada pharmacists and community nurses were trained to deliver the study intervention on risk prevention strategies to control hypertension. Intervention was randomly assigned to adult diabetic patients with blood pressure (BP) higher than 130/80 mm Hg. The intervention included active BP monitoring and recording in a wallet card, cardiovascular risk education and counselling, and hypertension education. Primary outcome measure was the difference in change in systolic BP between the 2 groups at 6 months. Over the trial period, systolic BP decreased in both groups, however the decrease was significantly greater in the intervention group after adjusting for baseline co-variables. The pharmacist and nurse team-based intervention resulted in a clinically important improvement in BP.<sup>33</sup>

### *Mental Illness*

Studies point out the array of pharmaceutical services provided by community pharmacists; those are medication counselling, review and treatment monitoring. Treatment monitoring by community pharmacists have been found to improve medication adherence among people undergoing antidepressant therapy.<sup>36-39</sup>

### *Osteoporosis*

Pharmacists can play a useful role in the identification, education, and referral of patients at risk for osteoporosis through pharmacy-based Bone Mineral Density screening.<sup>40</sup> Studies worldwide have highlighted the role of community pharmacies in conducting osteoporosis screening. Elliott et al<sup>41</sup> found that, screening rural elderly American women with a calcaneal dual energy x-ray absorptiometry (DXA) scanner in community pharmacies, led to women seeking medical advice and subsequent central DXA scanning and drug treatment.

## **Discussion**

This study summarises the roles played by the community pharmacist globally. Countries such as UK, Canada and Germany have realised the emerging new roles of the community pharmacist and have integrated them into the primary care teams, health promotion and disease management programmes.<sup>12-13,26,42-44</sup> In these countries, the

government works closely with the community pharmacists within a well-defined framework, which lays down the mutual benefits for both parties. In Sweden, all community pharmacies are State-owned (Apoteket), creating a very integrated and seamless (though monolithic) system for the public.<sup>45</sup>

In Singapore, the government does not contract services from the private pharmacy providers but instead relies on the pharmacies in the public sector (e.g. public primary care centers, public hospital pharmacies). Subsidies are provided only to patients accessing the public health services. There have been attempts by the private community pharmacies to provide some professional services e.g. medication review, but the service has been grossly underutilised due to a lack of funding, leaving them to now rethink of other viable business models. Services such as medication reconciliation and therapy optimisation for chronic diseases are proven effective for patient safety and good public health<sup>8-36</sup> and could be considerations for future development.

The lack of separation between prescribing and dispensing in Singapore leads to low prescription- dispensing workload at the pharmacies. The major portion of revenue is derived from the sales of other complementary (retail) products, instead of medicines. This has led to an overwhelming monopoly of private chain pharmacies due to the advantages of economies of scale in procurement.

The main activities of the community pharmacies in Singapore are providing advice on treatment of minor ailments, limited health promotion and dispensing. Although some private community pharmacies do provide pharmaceutical advice and counselling, the role is currently small. At some of the government primary care clinics, pharmacists have started contributing towards chronic disease management programmes, through pharmacist-led ambulatory care clinics for hypertension and anti-coagulation. Their role can be further strengthened and expanded to effectively and efficiently tap on their valuable contribution to patient care.

Key factors cited in the literature that impede the growth of community pharmacy are: insufficient integration of community pharmacist input into patient treatment pathways, poor relationship among pharmacists and physicians, lack of timely access to patient information, time constraints and inadequate compensation. Some of the recommendations to maximise benefits from community pharmacist services include, integrating work practices among community pharmacists and medical colleagues, targeted delivery of services to specific patients, providing access to patients' medical records, and improving communication with patients.<sup>18</sup>

### Limitations

This narrative review has some inherent limitations. Our search strategy was not exhaustive as the review focused only on indexed English language literature from Medline. Thus, a lot of non-English studies and studies indexed in other databases may have been missed. However, we included studies sourced from the grey and unpublished literature, to limit the bias in the process of locating and selecting studies. Although many studies point to the usefulness of services offered by community pharmacists, randomised controlled trials supporting those claims are limited. Despite these limitations, this manuscript provides crucial information on the evolving role of community pharmacist, which would potentially inform future healthcare management and public health policy.

### Conclusion

The current literature highlights the multifaceted role of the community pharmacist. Evidence of effectiveness for community pharmacy/ community pharmacist interventions exists for lipid, diabetes, and hypertension management and for preventive services such as weight management, osteoporosis prevention and flu immunisation services. Community pharmacists in Singapore could play a more active role in primary care, chronic disease management and health promotion programmes.

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