



## Community pharmacists on the frontline in the chronic disease management: The need for primary healthcare policy reforms in low and middle income countries

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### ABSTRACT

In low- and middle-income countries (LMICs), over 12 million people die yearly from chronic diseases and this number is expected to increase if concerted actions are not taken. The purpose of this paper is to highlight the roles and impact of community pharmacists in chronic disease management support and the need for policymakers in LMICs to reposition community pharmacists appropriately for this extended role. Recent findings have shown that community pharmacists are the most accessible healthcare providers to the members of the community. Published evidence have demonstrated that community pharmacists' interventions in chronic diseases significantly improve economic, clinical, and humanistic outcomes. However, they are not officially recognized as primary healthcare providers in LMICs. Therefore, there is need for policy reforms that will encourage strategic use of the clinical skills of community pharmacists as part of the primary healthcare team in LMICs.

### 1. Background

Current World Bank categorization, rank countries as low- and middle-income if their gross national income per capita are below US\$12,535.<sup>1</sup> In low- and middle- income countries (LMICs), over 12 million people die yearly from chronic diseases.<sup>2</sup> This high death toll highlights the importance of effective management of chronic diseases in LMICs. Therefore, investing in the management of chronic diseases is critical for any nation to safeguard the health of its population.

Chronic disease management interventions are of special interest to clinical pharmacists since most of the medical interventions require the use of prescription medications. Against this background, WHO has implored community pharmacists (CPs) to specifically support people with chronic diseases and improve their medication knowledge, their health-related quality of life (HRQoL), and self-management practices.<sup>3</sup> Moreover, the International Pharmaceutical Federation (FIP) adopted a statement on the role of pharmacists in chronic disease management that includes pharmaceutical care.<sup>4</sup> Pharmaceutical care creates opportunities for pharmacists to have a greater role in the care of patients with chronic diseases.

Community pharmacists are in a unique position to help patients manage their chronic illness through their prowess in medications, regular contact with patients, and easy accessibility. Despite these opportunities to improve public health, CPs are often underutilized healthcare providers.<sup>5</sup> Hence, the need for governments of various LMICs to officially tap into

CPs' great potential to improve public health and incorporate them into their primary healthcare programs. The purpose of this paper is to highlight the roles of CPs and to demonstrate their impact in chronic disease management and the need for policymakers in LMICs to reposition them appropriately for this extended role.

### 2. Community pharmacists and chronic disease management

Aside procurement and constant supply of relevant medications used for effective management of various chronic diseases, CPs by virtue of their pharmacotherapeutic knowledge, skills, medication expertise, and location within the communities, especially in most LMICs provide supportive care for cardiovascular diseases (CVDs), diabetes, asthma/chronic obstructive pulmonary disease (COPD), mental illness, and other chronic diseases.<sup>6</sup>

#### 2.1. Role of community pharmacists and their impact in hypertension management

Community pharmacists educate patients about hypertension and its management, monitor patients with elevated blood pressure (BP) on treatment, and refer those who do not achieve the target BP to their general practitioners (GPs).<sup>7,8</sup> Community pharmacists ensure that patients with hypertension follow their treatment plan, advise patients about relevant lifestyle modifications and coach them on how to measure and monitor their BP at home.<sup>8,9</sup> They also follow-up with patients, ensure adherence to treatment/medications in between the patient's visits to the GP.<sup>7</sup>

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Studies have demonstrated that interventions provided by CPs can have a positive impact on BP reduction.<sup>7,8,10,11</sup> Within Africa, a study conducted in Ghana showed that CPs' interventions significantly improved diastolic blood pressure (DBP) and medication adherence.<sup>7</sup> At least two studies conducted in Nigeria demonstrated that CPs' interventions improved BP control, thereby lowering cardiovascular risk among members of the community.<sup>7,11</sup> Within Asia, a study conducted in Pakistan noted that pharmacists' interventions improved patient's levels of knowledge about hypertension, medication adherence, BP control, and HRQoL.<sup>12</sup> Additionally, in Thailand, CPs' interventions demonstrated significant benefit in BP reduction and control, and improvement in medication adherence rate and lifestyle modification.<sup>13</sup> In Nepal CPs' interventions improved patients' knowledge of the disease, self-management practices, and BP control.<sup>8</sup>

A systematic review of the impact of pharmacists in improving Jordanian patients' health outcomes revealed an improved BP and lipid control.<sup>14</sup> Other systematic reviews have demonstrated improved BP control and medication adherence, supporting the positive impact of pharmacist-provided interventions in hypertension management.<sup>15,16</sup> Evidence from a meta-analysis of 39 randomized controlled trials (RCTs) with 14,224 patients showed significant reductions in systolic blood pressure (SBP) of 7.6 mmHg and DBP of 3.9 mmHg, supporting the benefits of pharmacist-provided interventions in hypertension management.<sup>17</sup>

## 2.2. Role of community pharmacists and their impact in diabetes management

Community pharmacists have a broad role in the management of patients with diabetes. Components of community pharmacy-based interventions include patient education/consultation about diabetes and its treatment, anti-diabetes medications, and lifestyle changes, insulin administration technique and storage, and self-blood glucose monitoring.<sup>18–20</sup> Other components include monitoring/reviewing glycemic control, monitoring and promoting medication adherence and self-management,<sup>18,19</sup> identifying, preventing, and resolving Drug Therapy Problems (DTPs,) monitoring BP, and lipid levels, weight management, reminding patients of the importance of regular screening for the presence of diabetic complications and home delivery of anti-diabetes medications and care.<sup>20–25</sup>

Community pharmacists interventions in diabetes management have been found to improve patient outcomes. Within Asia, at least two studies conducted in India showed that pharmacists' interventions significantly reduced fasting blood sugar, and improved knowledge of the disease and medication adherence among patients with diabetes.<sup>26,27</sup> Additionally, in Turkey, a study noted that a significant increase in the number of diabetic patients who achieved the target blood glucose level.<sup>28</sup> In Malaysia, CPs' interventions significantly reduced glycosylated hemoglobin (HbA1C) by 1.2%, post-prandial two hours blood glucose by 3.34 mmol/L, total cholesterol by 0.37 mmol/L, SBP by 9.1 mmHg, DBP by 4.8 mmHg, and improved medication adherence and satisfaction with clinical pharmacy services.<sup>29</sup> A community pharmacists' diabetes support program in Iran shows significant improvement in medication adherence and body mass index, while HbA1C level was lower in the intervention group.<sup>24</sup> In South America, a Brazilian study showed that CPs' interventions significantly reduced HbA1C and fasting blood sugar.<sup>30</sup> Within Europe, a study conducted in Bulgaria showed that CPs' educational interventions significantly reduced blood glucose from  $8 \pm 1.95$  mmol/L to  $7.2 \pm 0.99$  mmol/L and decreased the frequency of hypoglycemia/hyperglycemia from 58% to 0% with improvements in physical activity from 13.4% to 19.2% and mood from 12.5% to 19.2% at 6 months.<sup>31</sup>

A meta-analysis of 23 studies reported significant reductions in HbA1C levels of 0.71%, SBP of 5.20 mmHg, DBP of 3.51 mmHg, BMI scores of 0.49, total cholesterol levels of 0.19 mmol/L, low density lipoprotein-cholesterol of 0.16 mmol/L, and an increase in high density lipoprotein-cholesterol of 0.32 mmol/L.<sup>27</sup> Pooled results on six of the studies also showed patient-reported outcomes to be significant in four measured domains: general diet, self-monitoring blood glucose, foot care, and exercise. Additionally, the included studies reported improvements in adherence, HRQoL, and diabetes knowledge.<sup>27</sup> Other systematic reviews have reported

similar findings on the positive impact of pharmacists in diabetes management,<sup>18,19,32–36</sup> with one of the reviews including 43 studies and highlighting the abundant evidence available in the literature.<sup>19</sup>

## 2.3. Role of community pharmacists and their impact in asthma/chronic obstructive pulmonary disease (COPD)

Community pharmacists provide patient education about the disease conditions (symptoms, triggers, and early warnings) and medication counseling (medication choice, medication adherence, and correct use of the inhaler device and medication adherence.<sup>37–41</sup> They help evaluate patient's risk of aggravation of the disease, polypharmacy, medication interactions, and untreated underlying medical conditions.<sup>42</sup> Additionally, they can assist in self-management practices, promote smoking cessation, monitor disease and treatment process and refer patients with problems back to the general practitioners (GPs).<sup>43</sup>

In a study conducted in Turkey, CPs identified 59 DTPs and 134 causes for the problems among 44 patients with asthma and resolved 54.2% of the DTPs through the interventions provided. Similarly, 60 DTPs and 128 causes for the problems were identified among 37 patients with COPD with 95 interventions and a resolution rate of 63.3%.<sup>44</sup> In Brazil, CPs identified 277 DTPs through medication review, of which 53.1% were resolved.<sup>45</sup> Within Europe, a randomized controlled study conducted in Bulgaria showed that CPs' interventions decreased hospitalizations and length of hospital stay, and improved inhaler technique, HRQoL, and satisfaction among patients with asthma.<sup>39</sup> In a different Bulgarian study of patients with COPD, there was a 10% increase in FEV1, decreased interference with daily routine, and improved satisfaction with clinical pharmacy services at the community pharmacies.<sup>46</sup> Additionally, in Columbia, CPs' interventions in asthma showed 50% reduction in symptom scores, 11% increased peak flow readings, reduced days off work or school by one day per month and 50% reduced use of inhaled beta-agonists.<sup>47</sup> Other noted positive outcomes were 19% improved overall HRQoL, improved specific domains of activity limitations, symptoms and emotional function, initial knowledge scores doubled, 75% decreased emergency room visits, and medical visits, improved patient satisfaction with their pharmacy services and cost saving.<sup>47</sup> Systematic reviews corroborate these findings and provide additional evidence of benefits of pharmacist interventions in improving adherence.<sup>41,48</sup> Further, pooled results of meta-analyses show higher rates of medication adherence of 23–34% and improvement in inhalation technique of 85% in the intervention groups compared to controls.<sup>49,50</sup>

## 2.4. Role of community pharmacists and their impact in mental health

Medication use is one of the most effective ways to promote remission among patients with mental health disorders. Therefore, pharmacists can play a key role by providing mental health medication therapy management/review to improve access, ensure rational pharmacotherapy, provide information about the dosage regimen, promote medication adherence and meet other patients' mental health needs.<sup>51,52</sup> To ensure rational pharmacotherapy, CPs are well placed to identify, prevent or resolve DTPs in this patient group.<sup>52</sup> The educational process includes an explanation of the mechanism of action of the prescribed medication and clarification that the onset of action of the medication may not be immediate and that duration of therapy may be prolonged depending on the severity of the condition.<sup>51</sup>

Community pharmacists have the capacity to monitor patients with depression regularly for timely identification of suicidal ideations. The CPs can help remind patients with a mental disorder or their caregivers to consult with their physicians regularly. Health support that can be provided by CPs include monitoring medication effectiveness and toxicity, connecting patients with support systems (therapists, prescribers, peers, family and religious groups), medication therapy management, and the use of community programs and resources.<sup>53–56</sup>

Although the literature is sparse on CP interventions in LMICs, a Syrian study demonstrated that pharmacist's interventions significantly decreased DTPs and anxiety among refugees.<sup>57</sup> In general, there are some benefits showing benefits of CP interventions in mental health. A meta-analysis of six RCTs of CPs' interventions that included 887 patients with depression who were new or already on antidepressant drugs demonstrated a significant improvement in antidepressant medication adherence of 64%.<sup>58</sup>

### 3. A snapshot of community pharmacists' involvement in chronic disease management in high-income countries

Countries like the United States of America (USA), the United Kingdom (UK), Canada, Australia and Germany have recognized the essential role of community pharmacists (CPs) and have integrated them into primary care teams, health promotion, and disease management programs.<sup>59–64</sup> Within these high income countries (HICs), CPs provide numerous patient-centered healthcare interventions. Here the dynamics of professional pharmacy practice have shifted from the sale or dispensing of medications to the provision of patient-centered services that support better healthcare and achievement of positive health outcomes.<sup>65</sup>

In the UK, CPs are involved in chronic disease management under the National Health Service (NHS).<sup>66</sup> Community pharmacists offer comprehensive home medication reviews, collaborate with the GPs, formulate a care plan and monitor progress with a view to improving patients' health outcomes.<sup>67,68</sup> It is worthy to note that the overwhelming evidence of the untapped potentials of community pharmacy caused NHS England to offer pharmacy integration fund in 2016 to stimulate innovation and support community pharmacies to develop novel pharmaceutical care services, working practices, and digital infrastructures.<sup>66</sup> This recent UK supportive policy has highlighted an acknowledgement of the need for community pharmacy services to be integrated into a greater scope of primary healthcare.<sup>69,70</sup> Despite the presence of some barriers to pharmacists providing expanded services in the UK, it is evident that the primary healthcare contributions of the CPs are well recognized here by the key stakeholders.

In Germany, a nationwide contract between representatives of community pharmacy owners and Germany's largest health insurance fund in 2003 resulted in several pharmaceutical care programs for asthma, diabetes, hypertension, and the elderly in the community pharmacies.<sup>60</sup> In Finland, CPs have actively participated in the treatment and prevention of cardiac disease, and in the national public health programs since the late 1990s.<sup>71</sup> In Australia, the CPs work closely with GPs and other members of the healthcare team to address the medication needs of the community, extending the role of CPs beyond dispensing to medication review and chronic disease management.<sup>72</sup>

In Portugal, besides their regular dispensing role, CPs are involved in chronic disease management programs for diabetes, hypertension, and asthma.<sup>73</sup> In these HICs, the government works closely with the CPs within a well-defined framework, which specifies the mutual benefits for both parties.

### 4. A snapshot of community pharmacists' involvement in chronic disease management in low- and middle-income countries

In LMICs, evidence show that the majority of licensed pharmacists work in the community pharmacy setting.<sup>74–76</sup> A Cochrane review of the effect of pharmacist-clinical interventions in LMICs revealed that PC may improve chronic diseases clinical outcomes (blood sugar, BP and lipids levels, visits to GPs, and hospitalization rates), humanistic outcome (HRQoL).<sup>77</sup> Despite these potential positive impacts of pharmacists' interventions, governments of most of these countries have not officially integrated CPs into their national primary healthcare systems. For example in Nigeria, CPs have been rendering primary healthcare with extended roles in chronic disease management, public health, and health promotion unofficially.<sup>78,79</sup> In Malaysia, despite the lack of a legal framework for primary care roles,

CPs offer health screenings and chronic diseases services to the general public.<sup>80–83</sup> In Jordan, there is a lack of legal backing for pharmacist's primary care role<sup>84</sup> despite evidence that clinical pharmacy and medication therapy management services in hospitals and community pharmacies improved patient health outcomes.<sup>85–87</sup> In Iran, there is a lack of integration of community pharmacy in the primary healthcare (PHC) and this affects how CPs manage PHC services.<sup>88,89</sup> Due to the lack of integration of CPs into primary care in Lebanon, India, Turkey, and China, CPs provide minimal patient-centered care in these countries.<sup>90–94</sup>

Conversely, a few LMICs have made significant progress in the integration of CPs into the primary healthcare delivery system. In South Africa, the government has re-engineered its primary healthcare system and integrated CPs' roles in providing health promotion and chronic disease management support.<sup>95</sup> Similarly, in Brazil, the Federal Council of Pharmacists encourages the evolution of community pharmacies to become healthcare centers and to carry out primary care, disease management activities, and other crucial roles.<sup>6</sup> In Indonesia, some progress has also been made in the integration process. Here, pharmacists in 'puskesmas' (community health clinics) collaborate with other primary care providers to provide medication appropriateness, ensure the safety, efficacy, and adherence to medication, and make recommendations to the other team members, home care pharmacy programs, and public health campaigns to the general population.<sup>96</sup> Notwithstanding the progress made so far in these LMICs, major reforms are still required for the full integration of pharmacists in the primary healthcare system.

### 5. The key barriers that could impede chronic disease management by community pharmacists in low- and middle-income countries

Despite the evidence regarding the potentials of CPs to play an enhanced role in chronic disease management in LMICs, significant barriers exist. Some of these barriers include:

#### 5.1. Lack of supporting laws

Due to the lack of legislation to support the primary care role of CPs in most LMICs,<sup>76,86</sup> there is a lack of recognition of pharmacy services and the CP is not recognized as a member of the healthcare team.

#### 5.2. Shortage of community pharmacists

The ratio of pharmacists to the general population is still much lower in LMICs compared to HICs.<sup>97–102</sup> Due to poor working conditions in LMICs, a significant proportion of pharmacists including CPs migrate to HICs in search of greener pastures, and/or job satisfaction or to join family, leaving LMICs with chronic shortages of pharmacists. For example, in 2017, it was found that the median density of actively practicing pharmacists per 10,000 people in low-income countries was 12.7 times lower than that for HICs.<sup>103</sup> Evidence has shown that as the number of pharmacists per pharmacy increases, there is a proportionate increase in the number of clinical pharmacy services provided.<sup>104</sup>

#### 5.3. Lack or inadequate advanced training in chronic disease management

Most CPs in LMICs do not have advanced training or postgraduate degrees in clinical and social pharmacy to equip them with advanced clinical and therapeutic knowledge and skills required for effective chronic disease management.<sup>86,100,105–109</sup> The number of trained and competent pharmacists including CPs in LMICs may either be lacking or unable to match the population's needs.<sup>110</sup> A systematic review of the performance of retail pharmacies in LMICs Asian settings identified lack of training programs as a challenge confronting CPs.<sup>111</sup>



#### 5.4. Lack of collaborative practice with physicians

In terms of modifying a patient's treatment plan and referrals, this is considered to be a major barrier to successful resolution of drug therapy problems of problems identified through pharmacists' intervention in LMICs since physicians have a role in chronic disease management. In most LMICs, physicians prefer to work without a pharmacist and are reluctant to modify patient prescriptions following pharmacists' recommendations, even when the recommendations are evidence-based and of major concern.<sup>91</sup> Pharmacist's integration as a member of the healthcare team has been difficult to achieve because other members of that team especially physicians are not familiar with and/or are resistant to the extended clinical role of pharmacists.<sup>100,105,106,109,112–114</sup>

#### 5.5. Lack of reimbursement for clinical services

In the absence of commensurate financial incentives, CPs are not motivated to provide patient-centered services.<sup>93,94</sup>

### 6. Policy recommendations

#### 6.1. Primary healthcare policy reforms

These reforms are necessary to provide a legal framework for community pharmacies/pharmacists to be integrated into the primary healthcare system with coordinated collaborative multidisciplinary practice in the community setting. The extended role of CPs in chronic disease management support has the potential to offer people effective, convenient, and easily accessible services. In addition, this will help reduce duplication of work, relieve pressure on the wider health and social care system, and re-focus health systems towards health for all.

#### 6.2. Clinical training and competency development

Opportunities for training and mandatory professional development or continuing pharmacy education should be created for CPs in LMICs.<sup>115</sup> These must be provided to help CPs to keep up with the expanded roles in chronic disease management. Expanding the clinical knowledge and skills of pharmacists can make a remarkable impact on the health of general populations of LMICs. In addition, interprofessional workshops on the roles of the various healthcare providers with regards to chronic disease care activities should be implemented.

#### 6.3. Remuneration system

Government policies should make provision for CPs to be remunerated for their extended clinical pharmaceutical services. It is imperative that clinical services that synergize and expand integrated models and enhance access to services led by or provided collaboratively with pharmacists should be remunerated by the government in LMICs.

#### 6.4. Provision of incentives

There is a need for supportive policy action to offer incentives for the establishment of community pharmacies in the remote rural areas to ensure equitable distribution of community pharmacies. This strategy has the capacity to promote universal health care in LMICs.

### 7. Conclusion

Evidence show that CPs are critical to successful and sustainable national primary healthcare system. Despite the extensive contributions of CPs to the wellness of the population, they are yet to be officially recognized by most governments of LMICs as a member of the primary healthcare team. There is, therefore, a need to implement the

recommended policies in order to mitigate the identified barriers and enhance CPs extended role in LMICs.

### Declaration of Competing Interest

The authors do not have any conflict of interest or financial interest to disclose.

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