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REVIEW ARTICLE

The development of a role description and competency map for pharmacists in an interprofessional care setting

Helen Benson[1] · Cherie Lucas[1] · Shalom I. Benrimoj[2] · Kylie A. Williams[1]

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Abstract

Background Pharmacists are increasingly being included as members of general practice primary care teams. To date, there have been few published studies describing the competencies of general practice (GP) pharmacists and establishing their subsequent educational needs. *Aim of the review* The aim of this literature review is to establish the activities of pharmacists in general practice to inform the development of a comprehensive role description and competency map. *Method* A systematic literature search of EMBASE, MEDLINE, international pharmaceutical abstracts and the Cochrane database of systematic reviews was conducted from the start of the databases to August 2018. The search focused on studies investigating the roles performed by GP pharmacists. Full text peer-reviewed English language articles were included. A qualitative content analysis of included studies was performed. Two researchers reviewed studies to identify pharmacist roles. Subcategories of roles were then agreed by the research team and used to present the data. GP pharmacist's activities were mapped by two researchers to associated competencies. Any discrepancies between role descriptions and competency maps were resolved in consultation with a third member of the research team. *Results* The search conducted resulted in 5370 potential articles. Two hundred and twenty-seven full text articles were selected for review resulting in 34 articles that were included for analysis. Seven GP pharmacist role sub-categories and 48 GP pharmacist individual roles were identified. The seven GP pharmacist role sub-categories included medication management, patient examination and screening, chronic disease management, drug information and education, collaboration and liaison, audit and quality assurance and research. All FIP competency domains were included in the GP pharmacist competency map. Competencies related to compounding, dispensing and packaging of medications were not found relevant to the GP Pharmacist role. No roles were mapped to competencies relating to reimbursement for medicines, procurement, or medication production. All areas of professional and personal competence were relevant to the GP pharmacist role. *Conclusion* A comprehensive role description and competency map for GP pharmacists is described and may be used to inform future research into the education of GP pharmacists.

Keywords Australia · Collaborative care · General practice pharmacist · Integrated care · Interprofessional care · Non-dispensing pharmacist

Impacts on practice

- The comprehensive role description developed from literature review enables the GP Pharmacist scope of practice to be defined.
- A role description and competency map for general practice pharmacists facilitates the utilisation of the defined scope of practice and required competencies to be incorporated by those developing GP pharmacist interventions and designing training for GP pharmacists.

✉ Helen Benson
helen.benson@uts.edu.au

[1] Graduate School of Health, University of Technology Sydney, Level 4, Building 7, 67 Thomas St, Ultimo, P.O. Box 123, Sydney, NSW 2007, Australia

[2] Sydney Pharmacy School, The University of Sydney Australia, Pharmacy and Bank Building (A15), Science Road, Sydney, NSW 2006, Australia

Introduction

Previous systematic reviews on the integration of non-dispensing pharmacists in the primary care or general practice setting have highlighted their impact in chronic disease management and patient-centred care [1, 2]. General practice (GP) pharmacists are required to perform a wide range of professional activities and may require training to gain the competencies required to perform these roles [3, 4].

The implementation of competency-based education has been proposed as an evidence-based means for preparing healthcare professionals for the requirements of their roles [5–8]. Designing a competency based curriculum requires several steps including identifying the required competencies and professional requirements for the proposed role and then defining the required learning outcomes associated with the identified competencies [6–9].

Professional bodies such as the royal pharmaceutical society (RPS) and the Pharmaceutical Society of Australia (PSA) have developed role descriptions and competency maps for GP pharmacists however these documents were prepared for specific national contexts and there is no clear link to the evidence used to develop them [10, 11].

To date, only one published study was identified in the literature exploring the competencies required by GP pharmacists. This study was limited to the Canadian context and as a result may not be generalizable to all international settings [12, 13]. Other studies that have examined pharmacist competencies were not specific to the GP pharmacist role [14].

This narrative review aims to analyse the growing international evidence relating to GP pharmacists in order to develop a comprehensive description of roles and required competencies for pharmacists working with general practice teams.

Pharmacy practice educators will then be able to determine a list of educational needs and associated learning objectives to inform educational design and to ensure future practitioners are qualified to perform these roles.

Aim of the review

The aim of this literature review was to establish the activities of pharmacists in general practice to inform the development of a comprehensive role description and competency map.

Methods

Research design

This review follows the principles of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [15]. Methodological strategies for the review were discussed prior to each step of the process with all members of the research team and unclear issues were resolved together in consensus.

Literature search strategy

A systematic literature search of EMBASE, MEDLINE, International Pharmaceutical Abstracts (IPA) and the Cochrane Database of Systematic Reviews was conducted from the start of the databases to August 2018. The search was focused on studies investigating the roles performed by GP pharmacists. Full text peer-reviewed English language articles that involved qualitative, quantitative and mixed methods studies with any outcomes reported were included. Searches were conducted using Boolean logic, with Medical Subject Headings (MeSH) and terms. The search terms used were:

> pharmaceutical care OR pharmacy OR pharmacist AND general practice OR general practitioners OR general practitioner OR primary health care OR community health cent* OR health center OR family physicians OR (general adj2 practic*) OR (family adj2 practi*) OR (primary adj2 care) OR (family adj2 physician) OR clinic AND role OR professional competence OR clinical competence OR competence OR curriculum OR competency OR education.

Inclusion and exclusion criteria

GP pharmacists were defined as non-dispensing pharmacists operating in a general practice or medical centre setting [16]. Studies were excluded if they related to hospital, aged care or community pharmacy interventions, those not exclusively relating to pharmacists, those across multiple clinical settings. In addition, conference abstracts with no links to full text articles were excluded.

Screening of publications

In total 5370 articles were found in the databases used. Articles were compiled and duplicates were excluded. A

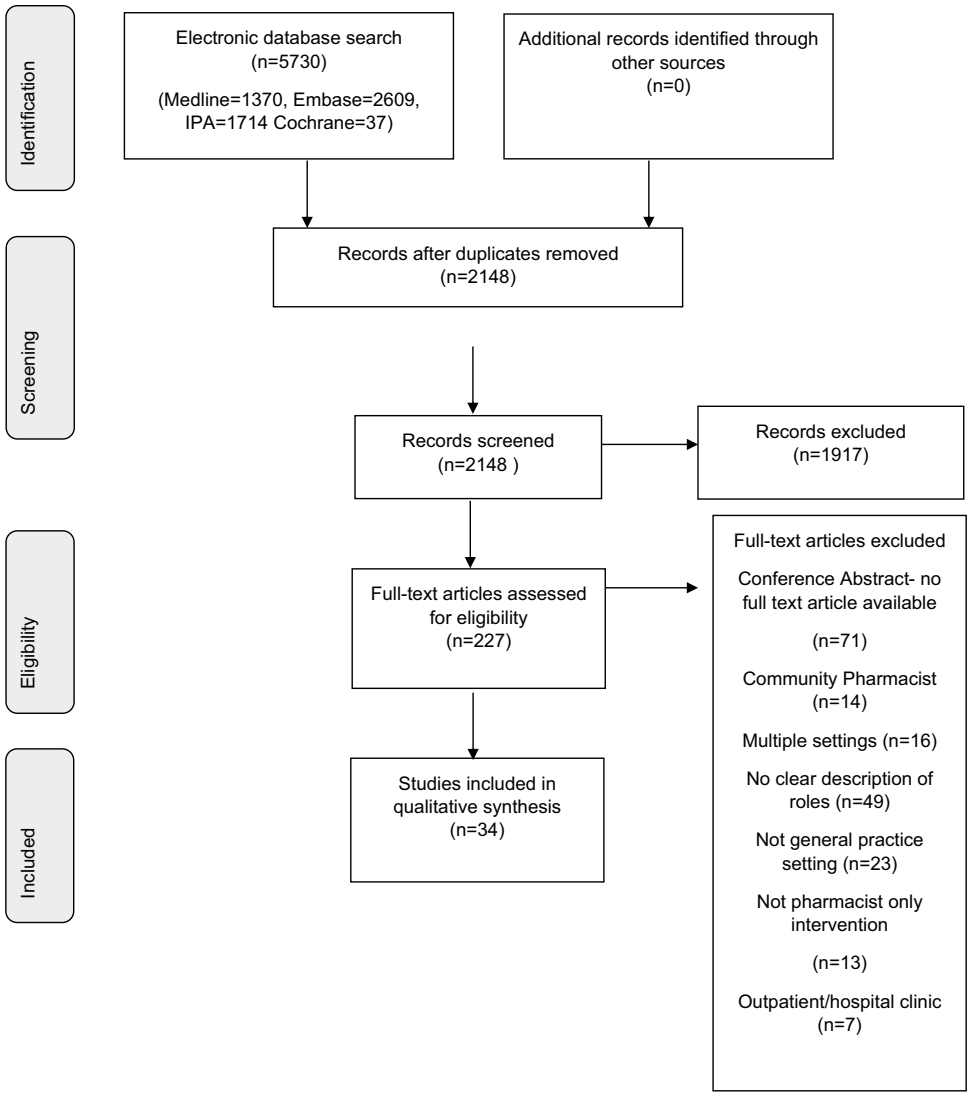

Fig. 1 Screening and selection of studies

PRISMA flow diagram representing the screening and selection of studies is shown in Fig. 1.

Titles and abstracts were screened against the inclusion criteria by one of the authors (HB). Any ambiguity/uncertainty about inclusion or exclusion of articles were discussed and resolved after reading the full text by three of the research team (HB, CL and KW). Full texts of the chosen articles were retrieved. The remaining 227 articles were read and assessed by two researchers (HB and CL) against the inclusion criteria.

Data analysis

A qualitative content analysis of included studies was performed. In order to gain a comprehensive role description the analysis focused on all study findings relevant to the study question, regardless of the type of study examined [16]. Two researchers (HB and NC) reviewed studies to identify pharmacist roles. The list of roles (content) was compiled and analysed by classifying activities of pharmacists into agreed discrete units of content (roles) [17]. Subcategories of roles were then agreed by the research team and used to present the data [18].

As the FIP (International Pharmaceutical Federation) global competency framework is not tailored to a specific country, but relevant across all countries, it was selected to classify the competency requirements of GP pharmacists [19]. This framework was developed to comprehensively map pharmacists' competencies and is aligned with other internationally established competency frameworks [20]. The FIP framework separates competencies into four domains: (1) pharmaceutical public health, (2) pharmaceutical care, (3) organisation and management and (4) professional/personal competencies. "Appendix" section details the complete list of FIP competencies.

Activities of GP pharmacists were mapped to corresponding FIP competencies independently by two researchers (HB and NC). Any discrepancies between role descriptions and competency maps were resolved in consultation with a third member of the research team (CL).

Results

Study characteristics

The 34 selected studies came from five countries with the majority (n = 22) from the USA [21–41], five from Australia [42–46], five from the UK [47–51], two from Canada [52, 53] and one from Brazil [54]. Articles varied from reviews of national case reports across multiple general practice locations to single site qualitative studies (Table 1).

Of the 34 articles analysed all were published between 1984 and 2018, with the majority of the articles (n = 30) being from 2010 onwards.

Roles performed by pharmacists

Figure 2 describes the seven GP pharmacist role sub-categories identified in the content analysis, which include 48 individual GP Pharmacist activities.

Competency mapping

Table 2 links the activities outlined in Fig. 2 to the number of studies describing each activity and then maps each activity to the corresponding FIP Competencies. The review of immunisations can be mapped to 1.1.1 which is to assess primary healthcare needs however, the administration of immunisations by GP pharmacists was not possible to be mapped to a FIP competency.

GP pharmacist activities required competencies from all four FIP framework domains. All competencies related to pharmaceutical public health were relevant for GP pharmacists.

In contrast, GP pharmacists are required to be competent in 17 of the 25 pharmaceutical care competencies but do not require the 8 pharmacist competencies relating to compounding, dispensing and packaging of medications.

Addressing adherence issues was the most common medication management activity with this role appearing in 21 of the 34 articles. Sixteen articles listed repeat and independent prescribing as activities performed by GP pharmacists.

In relation to organisation and management competencies, GP pharmacists do not require skills in arranging reimbursement for medicines, procurement competencies related to medication supply, or medication production competencies.

All 39 areas of professional and personal competence were found to be relevant to the GP pharmacist's role. Communication skills, continuing professional development, professional and ethical practice and self-management skills are relevant for all pharmacists. Quality assurance activities such as conducting drug use evaluations and prescribing audits are less commonly performed in community pharmacy and are particularly relevant to the GP pharmacist role.

Discussion

This narrative review is one of the first to assess the international literature to provide a comprehensive description of roles for GP pharmacists. By considering articles from multiple countries and contexts, the GP pharmacist role description is potentially generalisable for use internationally. In addition, using the FIP global competency framework to map competencies should allow individual countries to use this competency map and apply it to their local context.

Despite the fact that large numbers of pharmacists are integrated in general practice sites in the UK and Canada, the majority of included studies were derived from the USA. This may be because the focus of research in other locations has centred more towards assessing barriers and facilitators to the general practice pharmacist intervention and investigating outcomes associated with these interventions, rather than examining the roles performed by these pharmacists [55–65].

Medication management was one of the seven pharmacist role sub-categories and included the widely recognised roles of medication reconciliation and review, detection and resolution of medication related problems and addressing medication adherence barriers. These roles are within the usual scope of pharmacist practice although additional training in medication review is required for provision of these services in some countries [62].

Pharmacists are currently legally able to prescribe prescription medications in New Zealand, the UK, in certain provinces of Canada and in some states of the USA [63–65]. Studies have been conducted with pharmacist prescribers in Australia however, this role in not currently within the recognised scope of practice for Australian pharmacists [66].

Performing patient examination and screening including conducting physical examinations may require extra study and/or qualifications however, some activities such as performing blood glucose or blood pressure testing are well within the usual scope of pharmacist activities [67–69]. Recommending diagnostic tests is within the usual scope of pharmacist practice however, ordering of these tests independent from prescribers as listed in nine of the included studies may be considered outside the usual scope of pharmacist practice [70].

Table 1 Included articles

References	Country	Description
Tan et al. [42]	Australia	Multicentre prospective intervention study with a pre-post design (1 pharmacist, 2 general practice clinics)
Otaguro and Kruse [21]	USA	Prospective DRP study (2 FTE pharmacists, single site ambulatory care medical centre)
Mendonça et al. [54]	Brazil	Retrospective descriptive study (3 pharmacy students, 1 pharmacist, 3 family health unit sites)
Nigro et al. [22]	USA	Opinion paper reviewing PCMH practices and the roles performed by pharmacists within these practices (221 pharmacists, 312 PCMH sites)
Stone and Williams [47]	UK	Descriptive article describing the role of a GP pharmacist [1 pharmacist, multiple general practice sites in Tamar valley (number not specified)]
Boudreau et al. [23]	USA	Randomised trial of a clinical pharmacist consultation (1 pharmacist, single site academic general practice)
Gerber et al. [24]	USA	Randomised trial to evaluate the effectiveness of clinical pharmacists and health promoters on diabetes behaviours.(number of pharmacists not specified, single medical centre site)
Musselman et al. [25]	USA	Analysis of development and implementation of clinical pharmacist services integrated within a medical group (3 FTE pharmacists, 40 primary care and 60 specialty offices in USA)
Sisson et al. [26]	USA	Study examining contribution of an integrated pharmacist (single pharmacist, single safety-net clinic site)
Smith et al. [27]	USA	Retrospective cohort study examining the effectiveness of a care management program provided by clinical pharmacists for veterans with dyslipidaemia (1 pharmacist, 2 primary care clinics within a Veterans Affairs medical centre)
Benedict et al. [28]	USA	Retrospective cohort study examining type 2 diabetes management by clinical pharmacists (number of pharmacists not specified, large single site medical centre)
Carter et al. [29]	USA	Controlled study comparing prescribing patterns in family practice residency-training offices with clinical pharmacists (2 clinical pharmacists, 2 intervention and 2 control family practice sites)
Heilmann et al. [30]	USA	Description of activities of 37 pharmacists integrated in Kaiser Permanente of Colorado medical centres (30 FTE pharmacists, unspecified number of sites)
Barker et al. [31]	USA	Prospective cohort study conducted at one primary care practice with an integrated clinical pharmacist (1 pharmacist, single medical centre site)
Weidman-Evans et al. [32]	USA	Descriptive study examining the impact of a pharmacist run telephonic insulin titration service (4 FTE pharmacists, single academic family medicine clinic)
Kennedy et al. [33]	USA	Demonstration project to determine the impact of integrating pharmacists into primary care practices in Vermont 1 day per week (3.5 FTE pharmacists, 7 general practice sites)
Freeman et al. [43]	Australia	Qualitative study examining the views of 58 participants (8 GPs, 18 healthcare consumers, 28 pharmacists and 4 practice managers)
Kolodziejak et al. [52]	Canada	Results from a focus group study examining the activities of an integrated clinical pharmacist.(1 pharmacist, single academic medical centre site)
Tan et al. [1]	Australia	Qualitative survey of 27 participants investigating the integration of pharmacists in general practice clinics.(11 GPs and 16 pharmacists)
Joseph et al. [34]	USA	Literature review of pharmacist-driven services in accountable care organisations from 2009 to 2016 (2 GP pharmacists, literature review of 40 accountable care organisations)
Barnes et al. [48]	UK	Description of roles performed by clinical pharmacists as part of the NHS clinical pharmacist project (no specified number of pharmacists or sites)
Choe et al. [35]	USA	Describing the role of pharmacists in the patient centred medical home (2.5 FTE pharmacists, 8 general medical health centres)
Manolakis and Skelton [36]	USA	AACP report examining pharmacist's contributions in primary care (3 case studies unspecified number of pharmacists and sites)
Develin [45]	Australia	Descriptive article outlining the roles performed by a general practice pharmacist (3 part-time pharmacists at 3 general practice sites)
Albanese et al. [37]	USA	A cross-sectional on-line survey sent to primary care physicians, nurse practitioners and physician assistants regarding the role of pharmacists in the patient centred medical home (35 survey respondents 24 GPs, 7 pharmacists, 4 nurse practitioners)
Woodall et al. [38]	USA	Study examining the effectiveness and financial benefit of pharmacist-led annual wellness visits in conjunction with comprehensive medication management (1 pharmacist, single site community clinic)
Cawley et al. [39]	USA	Study aimed at examining integrated pharmacists providing spirometry services in the medical centre environment (case studies from 3 family health clinics)

Table 1 (continued)

References	Country	Description
Chen and Britten [49]	UK	Study examining the activities of primary care pharmacists in general practice (3 FTE pharmacists, number of general practice sites not specified)
Freeman et al. [46]	Australia	Electronic questionnaire completed by GP pharmacists in Australia (26 pharmacists)
Johnson et al. [40]	USA	Retrospective cohort study examining impact of integrated clinical pharmacists (number of pharmacists and safety-net clinics not specified)
Smith et al. [41]	USA	Review of pharmacist roles in the Patient Centred Medical Home (5 PCMH medication management programs (number of clinics not specified)
Farrell et al. [53]	Canada	Qualitative study investigating roles performed by integrated pharmacists (7 pharmacists, 6 family health teams)
Bradley et al. [50]	UK	Longitudinal study investigating roles performed by GP pharmacists (2 questionnaires completed by 158 pharmacists)
Ryan et al. [51]	UK	Exploratory, descriptive interview study (7 GPs, 6 Nurses, 8 practice managers, 9 patients, 5 pharmacists, 4 pharmacy technicians and 8 receptionists)

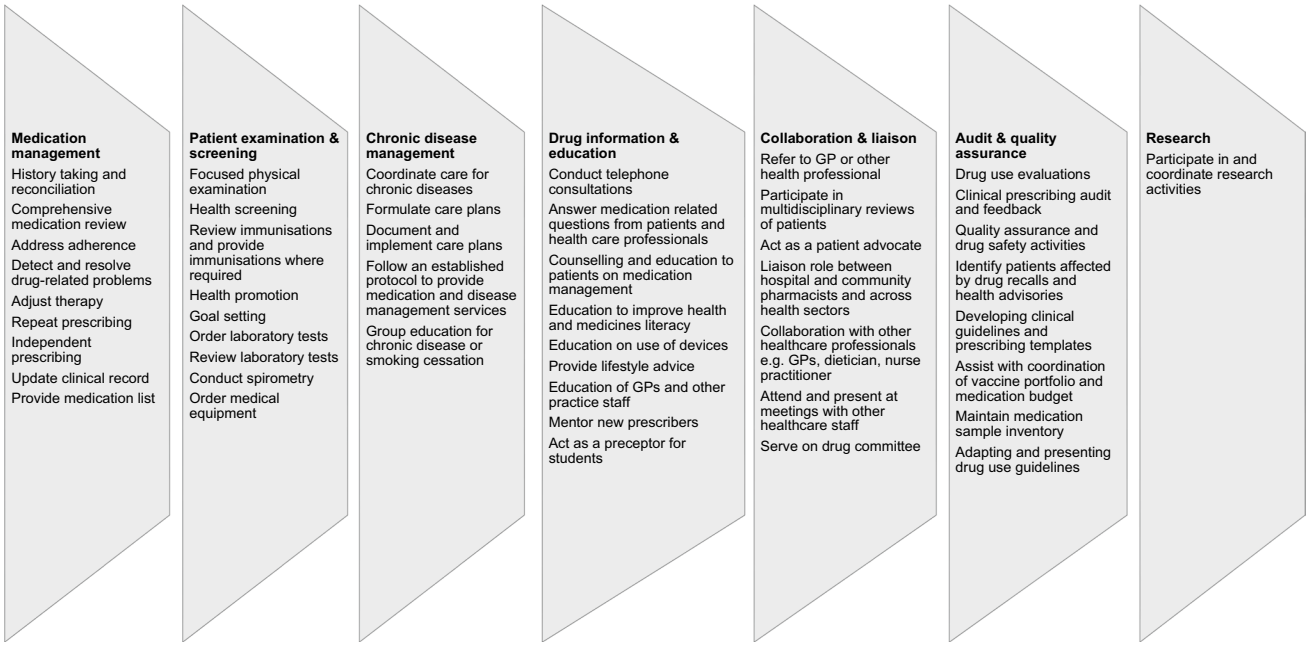

Fig. 2 Activities performed by GP pharmacists

The administration of immunisations by GP pharmacists was not able to be mapped to a FIP competency. The FIP competency framework was developed in 2012 and the provision of immunisations by pharmacists is an expanded area of pharmacist practice that has occurred since that time explaining the reason it is not included in the FIP competency list [71].

The most commonly reported chronic disease management activity was following an established management protocol to provide medication and disease management services. This role allows pharmacists to adjust doses of medication and to initiate or cease medications where outlined in the designated protocol. Performing this role requires GP pharmacists to have an advanced level of understanding in the disease state concerned and has traditionally required pharmacists to have advanced clinical skills or to have undergone additional training [72–75].

The majority of articles (n = 25) listed education and drug information activities performed by GP pharmacists. These roles are performed by pharmacists in all settings and are within the usual scope of pharmacist practice. The advanced level of communication skills required to competently provide drug information and education to GPs and other healthcare providers may require further training on the part of the pharmacist practitioner [75].

Table 2 GP Pharmacist activities and associated FIP competencies

Activities subcategories in italicizes	n = number of studies listing activity	Pharmaceutical public health competencies	Pharmaceutical care competencies	Organisation and management competencies	Professional/personal competencies
Medication management					
History taking and reconciliation	13		2.1.2; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.4; 2.6.6		4.1.4; 4.1.5; 4.3.1; 4.4.3; 4.5.2; 4.5.9
Comprehensive medication review	17	1.1.1; 1.1.2; 1.2.1; 1.2.2	2.1.1; 2.1.2; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.2; 2.6.3; 2.6.4; 2.6.5 2.6.6	3.2.3; 3.3.2; 3.6.6	4.1.2; 4.1.3; 4.1.4; 4.1.5; 4.3.1; 4.3.3; 4.3.6; 4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5
Address adherence	15	1.1.1; 1.1.2; 1.2.1; 1.2.2	2.4.3; 2.5.3; 2.6.4	3.3.2	4.1.2; 4.1.4; 4.1.5
Detect and resolve drug-related problems	18	1.2.2	2.1.1; 2.1.2; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.2; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.3.2	4.1.2; 4.1.4; 4.1.5; 4.4.2; 4.4.3; 4.4.5; 4.5.8
Adjust therapy	6	1.1.1; 1.2.1; 1.2.2	2.1.1; 2.1.2; 2.3.3; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.3.2	4.3.1; 4.3.6; 4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5
Repeat prescribing	8	1.1.1	2.1.1; 2.3.3; 2.4.3; 2.5.1; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.3.2	4.3.1; 4.3.6; 4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5
Independent prescribing	8	1.1.1; 1.2.1; 1.2.2	2.1.1; 2.1.2; 2.3.3; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.3.2	4.3.1; 4.3.6; 4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5
Update clinical record	4		2.6.5; 2.6.6		
Provide medication list	4	1.2.2	2.6.6		4.1.2
Patient examination and screening					
Focused physical examination	4		2.6.3		
Health screening	10	1.1.1	2.5.1; 2.5.2; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.3.2	4.1.2; 4.1.4; 4.1.5; 4.3.6; 4.4.2; 4.4.3
Review immunisations and administer immunisations where required[a]	5	1.1.1; 1.1.2; 1.2.2	2.1.1; 2.4.3; 2.5.1; 2.5.2; 2.6.1; 2.6.3; 2.6.4; 2.6.5; 2.6.6		4.1.2; 4.1.3; 4.1.4; 4.1.5; 4.3.6; 4.4.2; 4.4.3
Health promotion	3	1.1.1; 1.1.2; 1.2.2	2.6.4	3.2.1; 3.2.3; 3.2.5	4.1.2; 4.1.3; 4.1.4; 4.1.5
Goal setting	3	1.1.2	2.6.4	3.2.3	4.1.2; 4.1.3; 4.1.4; 4.1.5
Order laboratory tests	9		2.1.2; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.3	3.2.3; 3.3.2	4.1.2; 4.1.4
Review laboratory tests	6	1.1.1; 1.2.1	2.1.2; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.3; 2.6.6		4.1.2; 4.1.4; 4.4.4; 4.4.5
Conduct spirometry	1	1.1.1	2.6.3		4.1.2; 4.1.4; 4.1.5; 4.4.3
Order medical equipment	1	1.2.1	2.3.4	3.4.5; 3.4.6	
Chronic disease management					

Table 2 (continued)

Activities subcategories in italicizes	n = number of studies listing activity	Pharmaceutical public health competencies	Pharmaceutical care competencies	Organisation and management competencies	Professional/personal competencies
Coordinate care for chronic diseases	6	1.1.1; 1.1.2	2.1.1; 2.1.2; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.2; 2.6.3; 2.6.4;2.6.5;2.6.6	3.2.3; 3.2.5	4.1.2; 4.1.3; 4.1.4; 4.4.2; 4.4.3; 4.4.4; 4.6.2
Formulate care plans	6	1.1.1; 1.2.1	2.1.1; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.2; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.2.5	4.1.2; 4.1.4; 4.1.5; 4.3.1; 4.3.6; 4.4.2; 4.4.3; 4.4.5
Document and implement treatment plans	6	1.1.1; 1.2.1	2.1.1; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.2; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.2.5	4.1.2; 4.1.4; 4.1.5; 4.3.1; 4.3.6; 4.4.5
Follow an established protocol to provide medication and disease management services	13	1.1.1; 1.2.1	2.1.1; 2.1.2; 2.4.1; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.2; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3; 3.2.5; 3.3.2; 3.4.5; 3.6.2;3.6.6	4.1.2; 4.1.3; 4.1.4; 4.1.5; 4.3.1; 4.3.3; 4.3.6; 4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5
Group education for chronic disease or smoking cessation	2	1.1.1; 1.1.2; 1.2.1; 1.2.2			4.1.2; 4.1.3; 4.1.4; 4.1.5
Drug information and education					
Conduct telephone consultations	7	1.1.1, 1.1.2, 1.2.1;1.2.2	2.1.1; 2.1.2; 2.4.2; 2.4.3;2.5.1; 2.5.2; 2.5.3;2.6.2; 2.6.3; 2.6.4; 2.6.5; 2.6.6	3.2.3	4.1.2; 4.1.4; 4.1.5; 4.4.2
Answer medication related questions from patients and health care professionals	8	1.1.2; 1.2.1; 1.2.2	2.4.1; 2.4.3;2.5.2; 2.5.3; 2.6.4	3.3.2	4.1.1; 4.1.2; 4.1.3; 4.1.4; 4.1.5; 4.4.2
Counselling and education to patients on medication management	13	1.1.2; 1.2.1; 1.2.2	2.4.1; 2.4.3;2.5.2; 2.5.3; 2.6.4	3.3.2	4.1.2; 4.1.3; 4.1.4; 4.1.5; 4.4.2
Education to improve health and medicines literacy	9	1.1.1; 1.1.2; 1.2.1; 1.2.2	2.4.1; 2.4.3; 2.5.2; 2.5.3; 2.6.4	3.3.2	4.1.2; 4.1.3; 4.1.4; 4.1.5; 4.4.2
Education on use of devices	4	1.2.1; 1.2.2	2.3.4		4.1.2; 4.1.3; 4.1.4; 4.1.5
Provide lifestyle advice	8	1.1.1; 1.1.2; 1.2.1; 1.2.2			4.1.2; 4.1.3; 4.1.4; 4.1.5
Education of GPs and other practice staff	10	1.2.2		3.2.1; 3.2.3; 3.2.6	4.1.1; 4.1.2; 4.1.5; 4.3.3; 4.6.2
Mentor new prescribers	2			3.2.1; 3.2.6	4.1.1; 4.2.2; 4.2.3; 4.2.4; 4.2.5; 4.2.8; 4.6.1; 4.6.2
Act as a preceptor for students	6			3.2.6	4.1.1; 4.2.2; 4.2.3; 4.2.4; 4.2.5; 4.2.8; 4.6.1; 4.6.2
Collaboration/liaison					
Refer to GP or other health professional	7		2.6.2;	3.2.3; 3.2.5	4.1.2; 4.4.4; 4.4.5

Table 2 (continued)

Activities subcategories in italicizes	n = number of studies listing activity	Pharmaceutical public health competencies	Pharmaceutical care competencies	Organisation and management competencies	Professional/personal competencies
Participate in multidisciplinary reviews of patients	7	1.1.1	2.1.1; 2.1.2; 2.4.3; 2.5.1; 2.5.2; 2.5.3; 2.6.3; 2.6.4;2.6.5; 2.6.6	3.2.3; 3.2.5; 3.3.2	4.1.1;4.1.2;4.1.5; 4.3.1; 4.4.2; 4.4.3; 4.4.4; 4.6.2
Act as a patient advocate	3		2.4.3; 2.6.4		4.1.2; 4.1.5
Liaison role between hospital and community pharmacists and across health sectors	3	1.2.2		3.2.3; 3.2.5	4.1.2; 4.1.5; 4.4.2; 4.6.2
Collaboration with other healthcare professionals e.g. GPs, dietician, nurse practitioner	6	1.2.2	2.1.1; 2.6.2; 2.6.6	3.2.2; 3.2.3; 3.2.4; 3.2.5	4.1.2;4.1.5; 4.4.2; 4.6.2
Attend and present at meetings with other healthcare staff	3	1.2.2	2.5.1	3.2.1; 3.2.3; 3.2.5; 3.3.2; 3.6.5	4.1.2; 4.1.5; 4.3.1
Serve on drug committee	1	1.2.2	2.5.1	3.2.1; 3.2.3; 3.2.5; 3.3.2;3.4.1; 3.6.5	4.1.2; 4.1.5; 4.3.1
Audit and quality assurance					
Drug use evaluations	4		2.1.1; 2.5.1	3.2.1; 3.2.3; 3.3.2; 3.4.1; 3.6.5	4.1.2; 4.3.1; 4.3.6; 4.5.2; 4.5.3; 4.5.6; 4.5.7; 4.5.8; 4.5.9
Clinical prescribing audit and feedback	8		2.1.1; 2.5.1	3.2.1; 3.2.3; 3.3.2; 3.4.1; 3.6.5	4.1.2; 4.3.1; 4.3.6; 4.5.2; 4.5.3; 4.5.6; 4.5.7; 4.5.8; 4.5.9
Quality assurance and drug safety activities	6			3.2.3; 3.2.5; 3.3.2	4.5.2; 4.5.3; 4.5.4; 4.5.5; 4.5.6; 4.5.7; 4.5.8; 4.5.9
Identify patients affected by drug recalls and health advisories	3		2.3.2; 2.5.1; 2.5.3; 2.6.5	3.2.1; 3.2.3; 3.2.5; 3.3.2	4.1.2; 4.1.4; 4.4.2; 4.5.1; 4.5.8; 4.5.9
Developing clinical guidelines and prescribing templates	4	1.2.2	2.5.1	3.2.1; 3.2.3; 3.2.5; 3.3.2; 3.6.5	4.1.2; 4.1.5; 4.3.1
Assist with coordination of vaccine portfolio and medication budget	2			3.1.1; 3.1.2; 3.2.1; 3.2.3; 3.2.5; 3.4.1;3.4.5; 3.5.1; 3.5.2;3.5.3; 3.5.5	4.3.6
Maintain medication sample inventory	2			3.1.1; 3.1.2; 3.2.1; 3.2.3; 3.2.5; 3.4.1;3.4.5; 3.5.1; 3.5.2;3.5.3; 3.5.5	4.3.6
Adapting and presenting drug use guidelines	5	1.1.2	2.5.1	3.2.1; 3.2.3; 3.2.5; 3.6.5	4.3.6; 4.5.3; 4.5.6; 4.5.9
Research					
Participate in and coordinate research activities	1			3.2.1; 3.2.3; 3.3.1	4.5.1; 4.5.2; 4.5.3; 4.5.6; 4.5.7; 4.5.9; 4.6.2; 4.6.5

[a]Administration of immunisations by pharmacists not able to be mapped to FIP competency framework

Pharmacists providing audit and quality assurance services require an ability to communicate effectively and work collaboratively as part of an interprofessional team [76, 77]. As a result, including learning outcomes associated with communication and teamwork should be a focus for educational designers.

Previous competency maps have been developed for local implementation, or have not been specifically tailored for GP pharmacists [12, 14]. The competency map developed for GP pharmacists as a result of this review includes an international perspective and provides a comprehensive list of competencies required for pharmacists wishing to perform the GP Pharmacist role.

When establishing educational needs of GP pharmacists it is important to distinguish between base level activities and advanced practice activities requiring additional skills and knowledge [78]. Further studies are required to establish the educational needs of GP pharmacists. Once educational needs are established, an evidence based educational program can be designed to enable pharmacists develop the skills and knowledge required to perform the GP pharmacist's role.

Conclusion

This literature review has resulted in the development of a comprehensive description of roles for GP pharmacists. These GP pharmacist roles have then been used to inform the development of a global competency map for GP pharmacists. Using this competency map to design a competency-based training curriculum will ensure that the GP pharmacists of the future have the knowledge and skills to implement best practice primary care and improve the lives of the patients they treat.

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Appendix

See Table 3.

Table 3 FIP global competency frame work

Category	Competency	Behaviour
1. Pharmaceutical public health competencies	1.1 Health promotion	1.1.1 Assess the primary healthcare needs (taking into account the cultural and social setting of the patient)
		1.1.2 Advise on health promotion, disease prevention and control and healthy lifestyle
	1.2 Medicines information and advice	1.2.1 Counsel population on the safe and rational use of medicines and devices (including the selection, use, contraindications, storage and side effects of non-prescription and prescription medications)
		1.2.2 Identify sources, retrieve, evaluate, organise, assess and disseminate relevant medicines information according to the needs of patients and clients and provide appropriate information
2. Pharmaceutical care competencies	2.1 Assessment of medicines	2.1.1 Appropriately select medicines (e.g. according to the patient, hospital, government policy, etc.)
		2.1.2 Identify, prioritise and act upon medicine–medicine interactions, medicine disease interactions, medicine-patient interactions, medicine-food interactions
	2.2 Compounding medicines	2.2.1 Prepare pharmaceutical medicines (e.g. extemporaneous, cytotoxic medicines), determine the requirements for preparation (calculations, appropriate formulation, procedures, raw materials, equipment etc.)
		2.2.2 Compound under the good manufacturing practice for pharmaceutical (GMP) medicines
	2.3 Dispensing	2.3.1 Accurately dispense medicines for prescribed and/or minor ailments and monitor the dispense (re-checking the medicines)
		2.3.2 Accurately report defective or substandard medicines to the appropriate authorities
		2.3.3 Appropriately validate prescriptions, ensuring that prescriptions are correctly interpreted and legal
		2.3.4 Dispense devices (e.g. inhaler or a blood glucose meter)
		2.3.5 Document and act upon dispensing errors
		2.3.6 Implement and maintain a dispensing error reporting system and a "near misses" reporting system
		2.3.7 Label the medicines (with the required and appropriate information)
		2.3.8 Learn from and act upon previous "near misses" and "dispensing errors"

Table 3 (continued)

Category	Competency	Behaviour
	2.4 Medicines	2.4.1 Advise patients on proper storage conditions of the medicines and ensure that medicine
		2.4.2 Appropriately select medicines formulation and concentration for minor ailments (e.g. diarrhoea, constipation, cough, hay fever, insect bites etc.)
		2.4.3 Ensure appropriate medicines, route, time, dose, documentation, action, form and response for individual patients
		2.4.4 Package medicines to optimise safety (ensuring appropriate re-packaging and labelling of the medicines)
	2.5 Monitor medicines therapy	2.5.1 Apply guidelines, medicines formulary system, protocols and treatment pathways
		2.5.2 Ensure therapeutic medicines monitoring, impact and outcomes (including objective and subjective measures)
		2.5.3 Identify, prioritise and resolve medicines management problems (including errors)
	2.6 Patient consultation and diagnosis	2.6.1 Apply first aid and act upon arranging follow-up care
		2.6.2 Appropriately refer
		2.6.3 Assess and diagnose based on objective and subjective measures
		2.6.4 Discuss and agree with the patients the appropriate use of medicines, taking into account patient's preferences
		2.6.5 Document any intervention (e.g. document allergies, medicines and food, in patient medicines history)
		2.6.6 Obtain, reconcile, review, maintain and update relevant patient medication and diseases history
3. Organisation and management competencies	3.1 Budget and re-imbursement	3.1.1 Acknowledge the organisational structure
		3.1.2 Effectively set and apply budgets
		3.1.3 Ensure appropriate claim for reimbursement
		3.1.4 Ensure financial transparency
		3.1.5 Ensure proper reference sources for service reimbursement
	3.2 Human resources management	3.2.1 Demonstrate organisational and management skills (e.g. know understand and lead on medicines management, risk management, self-management, time management, people management, project management, policy management)
		3.2.2 Identify and manage human resources and staffing issues
		3.2.3 Participate, collaborate, advise in therapeutic decision-making and use appropriate referral in a multi-disciplinary team

Table 3 (continued)

Category	Competency	Behaviour
		3.2.4 Recognise and manage the potential of each member of the staff and utilise systems for performance management (e.g. carry out staff appraisals)
		3.2.5 Recognise the value of the pharmacy team and of a multidisciplinary team
		3.2.6 Support and facilitate staff training and continuing professional development
	3.3 Improvement of service	3.3.1 Identify and implement new services (according to local needs)
		3.3.2 Resolve, follow up and prevent medicines related problems
	3.4 Procurement	3.4.1 Access reliable information and ensure the most cost-effective medicines in the right quantities with the appropriate quality
		3.4.2 Develop and implement contingency plan for shortages
		3.4.3 Efficiently link procurement to formulary, to push/pull system (supply chain management) and payment mechanisms
		3.4.4 Ensure there is no conflict of interest
		3.4.5 Select reliable supplies of high-quality products (including appropriate selection process, cost effectiveness, timely delivery)
		3.4.6 Supervise procurement activities
		3.4.7 Understand the tendering methods and evaluation of tender bids
	3.5 Supply chain and management	3.5.1 Demonstrate knowledge in store medicines to minimise errors and maximise accuracy
		3.5.2 Ensure accurate verification of rolling stocks
		3.5.3 Ensure effective stock management and running of service with the dispensary
		3.5.4 Ensure logistics of delivery and storage
		3.5.5 Implement a system for documentation and record keeping
		3.5.6 Take responsibility for quantification of forecasting
	3.6 Work place management	3.6.1 Address and manage day to day management issues
		3.6.2 Demonstrate the ability to take accurate and timely decisions and make appropriate judgements
		3.6.3 Ensure the production schedules are appropriately planned and managed
		3.6.4 Ensure the work time is appropriately planned and managed
		3.6.5 Improve and manage the provision of pharmaceutical services
		3.6.6 Recognise and manage pharmacy resources (e.g. financial, infrastructure)

Table 3 (continued)

Category	Competency	Behaviour
4. Professional/personal competencies	4.1 Communication skills	4.1.1 Communicate clearly, precisely and appropriately while being a mentor or tutor
		4.1.2 Communicate effectively with health and social care staff, support staff, patients carer, family relatives and clines/customers, using lay terms and checking understanding
		4.1.3 Demonstrate cultural awareness and sensitivity
		4.1.4 Tailor communications to patient needs
		4.1.5 Use appropriate communication skills to build, report and engage with patients, health and social care staff and voluntary services (e.g. verbal and non-verbal)
	4.2 Continuing professional development	4.2.1 Document CPD activities
		4.2.2 Engage with students/interns/residents
		4.2.3 Evaluate currency of knowledge and skills
		4.2.4 Evaluate learning
		4.2.5 Identify if expertise needed outside the scope of knowledge
		4.2.6 Identify learning needs
		4.2.7 Recognise own limitations and act upon them
		4.2.8 Reflect on performance
	4.3 Legal and regulatory practice	4.3.1 Apply and understand regulatory affairs and the key aspects of pharmaceutical registration and legislation
		4.3.2 Apply knowledge in relation to the principals of business economics and intellectual property rights including the basics of patent interpretation
		4.3.3 Be aware of and identify new medicines coming to the market
		4.3.4 Comply with legislation for drugs with the potential for abuse
		4.3.5 Demonstrate knowledge in marketing and sales
		4.3.6 Engage with health and medicines policies
		4.3.7 Engage with health and medicines policies
	4.4 Professional and ethical practice	4.4.1 Demonstrate awareness of local/national codes of ethics
		4.4.2 Ensure confidentiality (with the patient and with other healthcare professionals)
		4.4.3 Obtain patient consent (it can be implicit on occasion)
		4.4.4 Recognise own professional limitations
		4.4.5 Take responsibility for own action and for patient care

Table 3 (continued)

Category	Competency	Behaviour
	4.5 Quality assurance and research in the workplace	4.5.1 Apply research findings and understand the benefit risk (e.g. preclinical. Clinical trials, experimental clinical-pharmacological research and risk management)
		4.5.2 Audit quality of service (ensure that they meet local and national standards and specifications)
		4.5.3 Develop and implement Standard Operating Procedures (SOPs)
		4.5.4 Ensure appropriate quality control tests are performed and managed appropriately
		4.5.5 Ensures medicines are not counterfeit and quality standards
		4.5.6 Identify and evaluate evidence base to improve the use of medicines and services.
		4.5.7 Identify, investigate and conduct, supervise and support research at the workplace (enquiry-driven practice)
		4.5.8 Implement conduct and maintain a reporting system of pharmacovigilance (e.g. report adverse drug reactions)
		4.5.9 Initiate and implement audit and research activities
	4.6 Self-management	4.6.1 Apply assertiveness skills
		4.6.2 Demonstrate leadership and practice management skills, initiative and efficiency
		4.6.3 Document risk management (e.g. critical incidents)
		4.6.4 Ensure punctuality
		4.6.5 Prioritise work and implement innovative ideas

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